

# STATE OF MONTANA INTEGRATED SOLID WASTE MANAGEMENT PLAN

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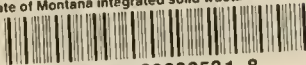
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Wilber Wood	Alternative Energy Resources Organization/Northern Plains Resources Council

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were held in the following communities: Billings, Bozeman, Butte, Dillon, Glasgow, Glendive, Great Falls, Havre, Helena, Kalispell, Lewistown, Malta, Missoula, Miles City, and Sidney. A public scoping meeting was also held in Billings with the Indian Health Service. A summary of the public scoping comments is found in Appendix B.

## KEY TO ACRONYMS

BACT	Best Available Control Technology
Btu	British thermal unit
C/D	Construction and/or Demolition debris
CESQG	Conditionally Exempt Small Quantity Generator (of hazardous waste)
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
DIYs	Do-It-Yourselfers (Those who change their own motor oil)
EPA	(U.S.) Environmental Protection Agency
EQC	(Montana) Environmental Quality Council
HHW	Household Hazardous Waste
IWMA	Integrated Waste Management Act
MACo	Montana Association of Counties
MCA	Montana Code Annotated
MDHES	Montana Department of Health and Environmental Sciences
MRF	Materials Recovery Facility
MSU	Montana State University
MSW	Municipal Solid Waste
MSWLFs	Municipal Solid Waste Landfills
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
RCRA	Resource Conservation and Recovery Act
SHWB	Solid and Hazardous Waste Bureau
SIC	Standard Industrial Code
SWM	Solid Waste Management (Program)
SWMA	Solid Waste Management Act
SWPAC	Solid Waste Plan Advisory Committee
tpd	Tons per day
TSDF	Treatment Storage and Disposal Facility
VOCs	Volatile Organic Compounds

## CHAPTER 1. INTRODUCTION

The mission of the Solid Waste Management (SWM) Program of the Montana Department of Health and Environmental Sciences is "to protect public health and the environment from the effects of improper, inadequate, or unsound management of solid wastes and to ensure that the management of solid wastes is planned so as to preserve Montana's resources for future generations".<sup>1</sup> For the past 25 years, the first part of the mission statement--the management of waste--has been emphasized. Most activity has been focused on the regulation of landfilling.

The focus is changing. The 1991 Montana Legislature passed the Integrated Waste Management Act (IWMA) which will shift the SWM Program toward a more balanced approach between the management of waste and the conservation of resources. The Act established a waste reduction goal of 25% by 1996. It also adopted an integrated waste management policy which must be based on the following order of priority:

1. Source reduction
2. Reuse
3. Recycling
4. Composting
5. Landfill disposal or incineration

In other words, those who manage solid waste in Montana are to implement source reduction, reuse, recycling, and composting prior to disposal or incineration. The SWM Program must lead the way toward an integrated waste management approach.

### CONTENT AND PURPOSE OF THE PLAN

The Integrated Waste Management Act also requires the Montana Department of Health and Environmental Sciences (MDHES) to prepare and implement a state solid waste management plan. The plan suggests policy and provides guidance for the State of Montana as we seek to improve our landfills to better protect the public health, and as we move toward a more integrated approach to waste management. The plan may also serve as a guidance document and educational tool for local and tribal governments as they plan for solid waste management in the coming decades. The plan does not place requirements on local or tribal governments, citizens, or the private sector. Rather, it invites them all to participate as the state reaches toward and beyond its 25% waste reduction goal.

The plan is both forward-looking and practical. It sets long-term goals that envision an ideal future. Then it assesses alternative strategies for reaching that ideal and makes recommendations for practical first steps the state must take in the next five years.

The plan will be a continually evolving document. Information and policies are changing rapidly in the area of solid waste management, and in order to remain current and effective, the plan must change along with them. The SWM Program will review the plan regularly and update it every five years.

The law requires that the plan be comprehensive and integrated and do at least the following:

- (a) identify existing disposal capacity, estimate waste generation rates, determine disposal capacity needed for the future, assess potential effect of inter-state disposal on capacity;
- (b) incorporate federal regulations 40 CFR Parts 257 and 258 (Subtitle D regulations);
- (c) identify the role of each component of the integrated waste management priorities;
- (d) assess the availability and practicality of alternative technologies for solid waste management;
- (e) identify existing waste education and information programs and describe how the state will increase the awareness and cooperation of the public in environmentally safe solid waste management;
- (f) identify types and quantities of wastes that create special disposal problems and recommend methods for reducing, handling, collecting, transporting, and disposing of those wastes; identify existing and future strategies for managing those wastes;
- (g) identify needs of rural communities and management strategies to address those needs;
- (h) identify mechanisms to ensure proper training of landfill operators; and
- (i) provide a timeline and implementation strategy for (a) through (h) above.

These requirements are addressed in the following chapters:

- Chapter 2 provides an overview of waste management in Montana, including waste generation rates as required in (a).
- Chapter 3 addresses 40 CFR Part 258 (Subtitle D Regulations) and the U.S. Environmental Protection Agency's (EPA) approval of Montana's counterpart program for regulating its landfills. The chapter meets the requirements of (b).



- Chapter 4 covers the issues of current capacity, future capacity needs, and the effects of importation on capacity, meeting the requirements of (a). It also discusses regionalization and planning for waste management.
- Chapter 5 gives an overview of integrated waste management and provides general recommendations for issues common to several or all of the waste management priorities. Public education, as one of the common areas, is discussed in this chapter, meeting the requirements of (e).
- Chapters 6-11 discusses each component of integrated waste management as required in (c). Each chapter makes recommendations and assesses strategies or alternative technologies related to each component as required in (d). Chapter 10 covers landfill operator training required in (h).
- Chapter 12 identifies special problems associated with the management of particular wastes and offers recommendations, meeting the requirements of (f).
- Chapter 13 identifies issues related to industrial waste and describes how these issues fit into the state plan.
- Chapter 14 describes some ideal integrated systems for Montana and suggests an implementation strategy for local waste managers. It addresses (g).
- Chapter 15 summarizes the recommendations and discusses the timeline for their implementation, meeting the requirements of (i).
- Chapter 16 summarizes citizen comments to the draft of the plan and presents the response of the Montana Department of Health and Environmental Sciences to the comments.

## ROLES AND RESPONSIBILITIES

Once the minimum standards set by the federal government are met, solid waste management becomes the concern of many segments of Montana's economy and society. Tribal, state, and local governments, the legislature, the private sector and citizens each have specific roles and responsibilities.

### Federal Government

The federal government regulates the management of wastes under the Resource Conservation and Recovery Act (RCRA) of 1976. Municipal solid waste (MSW) is regulated under Subtitle D of RCRA which encourages environmentally sound disposal practices and recovery of resources. The regulations in Subtitle D, 40 CFR Part 258, specifically establish technical standards for siting, design, operation, closure, post-closure, financial assurance, ground water monitoring, and corrective action for municipal solid waste landfills (MSWLFs).

The Clean Air Act requires incinerators to meet performance standards that limit toxic emissions to the air by using the best available technology. The Clean Water Act affects waste disposal facilities which generate leachate or discharge to surface waters.

### The Montana State Legislature

The legislature may enact laws regulating management of solid waste and conservation of resources. These laws must meet the minimum requirements of federal law, but may set more stringent standards. The primary laws regulating solid waste are:

1. The Solid Waste Management Districts Act (Title 7, Chapter 13, Part 2, Montana Code Annotated [MCA])
2. The Montana Environmental Policy Act (Title 75, Chapter 1, Parts 1-3, MCA)
3. The Montana Solid Waste Management Act (Title 75, Chapter 10, Parts 1 and 2, MCA)
4. The Integrated Waste Management Act (Title 75, Chapter 10, Part 8, MCA)
5. The Infectious Waste Management Act (Title 75, Chapter 10, Part 10, MCA)

The legislature may wish to examine the ideas in this plan as it considers future laws governing solid waste management. Some of the ideas presented may require the force of law to be fully implemented across the state.

### State Government

The Solid Waste Management (SWM) Program within the Montana Department of Health and Environmental Sciences (MDHES) is authorized to implement the requirements of state law. The SWM Program is specifically given the authority to license and inspect solid waste facilities, to write and implement an integrated solid waste management plan, to provide technical assistance to solid waste facility operators and decision-makers, to provide financial

assistance to local governments when funds are available, and to serve as an information and educational clearinghouse to the public for integrated waste management issues.

The SWM Program is responsible for achieving and maintaining approval from the EPA, to ensure that municipal solid waste landfills (MSWLFs) comply with the Federal criteria 40 CFR Part 258 (Subtitle D Regulations). This responsibility is discussed in Chapter 3.

The Air Quality Program, Water Quality Program, and Superfund Program, all within MDHES, and the Public Service Commission also affect solid waste management issues in certain situations.

The SWM Program and other state government agencies will examine the recommendations and strategies in this plan to determine what practices, guidelines, and regulations need revision as Montana moves forward toward integrated waste management.

#### Local Government

Local governments hold primary responsibility for solid waste planning and for financing, designing, constructing, and operating a solid waste management system consistent with the state's solid waste management plan and applicable state laws and regulations. They may also contract with the private sector for these functions. County commissioners have the authority to create solid waste management districts for the purpose of collection and/or disposal of municipal solid waste (MSW). The districts may include cities and towns, and parts or all of one or more counties.

Local governments are responsible for involving the public in solid waste decision-making. Using a combination of public input and the information presented in this plan, they are asked to develop and implement integrated waste management strategies which will help the state achieve its 25% waste reduction goal.

#### Tribal Government

There are 10 federally recognized Indian tribes on seven reservations covering more than 8.3 million acres in Montana. Tribes are required to comply with all federal laws and regulations mentioned above. Regardless of complex legal questions around state authority for solid waste management on reservations, all parties recognize that environmental impacts and issues are not contained by jurisdictional boundaries. Because there is a common interest in planning for effective and environmentally sound solid waste management, tribal governments are encouraged to consider the recommendations presented in this plan and work with neighboring local governments for area-wide solutions to disposal, recycling, and waste reduction. The State-Tribal Cooperative Agreements Act<sup>2</sup> allows for such agreements and gives an outline for their legal requirements.



### The Private Sector

Private solid waste management companies have played an active role in Montana. Due to increasing costs of waste management, that participation is likely to expand in the future. The Solid Waste Management Act sets the policy that "private industry is to be utilized to the maximum extent possible in planning, designing, managing, constructing, operating, manufacturing, and marketing functions related to solid waste management systems".<sup>3</sup> The Act then reaffirms that local governments retain primary responsibility for adequate solid waste management.

Some local waste managers apparently see a contradiction in the law. The SWM Program interprets it to mean that local governments are encouraged to contract with the private sector for day-to-day operations of particular segments of the waste management system, whenever it is feasible to do so. Whether or not they use the private sector however, the local government is responsible for the overall planning, financing, and operation of the entire system.

In considering whether or not to use the private sector, local officials are encouraged to consult with other local officials who have faced a similar choice. Those who support private participation point out that private companies contribute to the tax base, that they can operate more efficiently, that they usually have more resources for providing environmental protection or extra services such as recycling, and that the company is financially accountable in the event of environmental damage. In addition, local government is relieved from needing to provide the technical expertise required in modern waste management operations.

Those who support public operation of solid waste systems point out that the government maintains more control over waste management costs and the price their citizens pay for waste services. They also state that if the private company holds the waste hauling permit granted by the Public Service Commission, and also runs the landfill, they can gain a near monopoly without rate regulation.

All private businesses, whether or not they are associated with solid waste management, are encouraged to adopt appropriate recommendations for integrated waste management as presented in this plan. Businesses should make a commitment to implementing waste reduction measures in their purchasing and operations.

This plan will help private industry understand the direction the state is headed in solid waste management so they can make better business decisions. The state cannot meet the 25% waste reduction goal without the cooperation of the private sector.

### Citizens

Citizens are encouraged to take every opportunity to attend meetings and public hearings to learn about, help develop, and participate in integrated waste management opportunities in their communities. Citizens have a responsibility to seek out accurate information on waste management options and to take personal measures to help the state achieve waste reduction.

Individuals may also use this plan to inform themselves and local decision-makers about the direction the state is headed in solid waste management. They may use it to encourage local decision-makers to form citizens' advisory committees and to involve the public in solid waste management through public meetings, workshops, and presentations to civic organizations, schools, and churches. They may use it to encourage their local waste managers, institutions, businesses, or community organizations to write and implement a local solid waste management plan.

## HOW TO USE THIS DOCUMENT

This Integrated Solid Waste Management Plan will only be effective if all groups mentioned above participate. State, tribal, and local governments, the legislature, the private sector, and individual citizens must work together if the state is to realize the vision outlined in this plan.

Many chapters contain a variety of implementation ideas which may be called "Recommendations" or "Strategies for Consideration". The difference between these categories is somewhat artificial. If the idea met with general approval of the Solid Waste Plan Advisory Committee (SWPAC), it was placed in the "Recommendations" section. If the idea met with a significant difference of opinion, it was placed in the "Strategies for Consideration" section. All recommendations and strategies have been implemented successfully in some states or communities and are worthy of consideration for Montana. Readers will want to examine both lists and make a determination of which ideas make the most sense in the situation they are exploring.

The "Recommendations" and "Strategies" are generic and may apply to any or all segments of Montana's economy and society mentioned in the previous section. Each recommendation or strategy is briefly described. If the SWM Program has a role to play in implementing a "recommendation", that role is identified. The discussion for each "strategy" attempts to present two or more sides to the issue.

All readers should carefully examine each idea in both lists, and decide what they (or the group they represent) should do to implement the idea, and voluntarily take those steps. Chapters 14 and 15 should be useful to local planners in sorting through the recommendations contained in this plan and implementing them in their communities. Readers may contact the

Waste Reduction and Recycling Coordinator in the SWM Program for further resources and assistance in implementing the ideas.

### A VISION FOR MONTANA

In an ideal world in the year 2013, Montana citizens will be fully informed about waste management options. They will participate in planning and implementing waste reduction strategies in their communities and homes. Products will be designed to last longer and will be sold with less packaging. Environmentally-safe alternatives will be readily available for all hazardous products. Waste facilities will become community resource centers as more broken products are repaired and more old products are reused. More resources will be recovered through recycling. More organic wastes will be recycled through composting. The remaining amount of waste in need of disposal will be minimal. It will go to one of a few landfills in the state, where the best available technology will be operating to protect the environment.

How close can we come to this vision? Can we surpass it with new innovations? There is no magic formula. It's up to all of us--the people of Montana.

### Endnotes

1. Solid Waste Management Program, "Mission Statement, Objectives and Program Plan for Fiscal Years 1992-93," Department of Health and Environmental Sciences, Solid and Hazardous Waste Bureau, Helena, MT, 1992

2. Sections 18-11-101 through 111, MCA

3. Sections 75-10-100 through 233, MCA

**PART I**  
**WHERE WE ARE NOW**





## **CHAPTER 2. SOLID WASTE MANAGEMENT IN MONTANA**

### **HISTORY OF WASTE DISPOSAL**

#### The Sixties

In the early 1960s there were 514 Montana communities on the map. It is likely that each had their own "dump", or more than one. These dumps, often located in a nearby gully, were usually unattended piles of burned refuse. Occasionally, portions of the waste may have been buried. State officials might have taken a look at the dump occasionally, and suggested operational or cleanup measures, but no one had authority to take official action.

In response to federal legislation, Montana passed its first solid waste management law in 1965. State officials began putting some pressure on the small communities to consolidate their dumps and begin operating "sanitary landfills." That essentially meant to stop open burning, apply daily cover, and control litter. State-wide attention to waste management became the distinct responsibility of one or two employees within the Montana Department of Health and Environmental Sciences (MDHES).

In 1967, MDHES conducted a survey to determine the status of solid waste practices in Montana. The survey pointed out a lack of mechanisms for local government to fund waste disposal. The Refuse Disposal District Law, passed in 1969, made it possible for a county or several counties to set up a refuse district to develop waste management plans and to implement fees for waste disposal.

At the same time, MDHES set deadlines for Montana landfills to comply with specific operational criteria. Compliance was to occur between 1971 and 1974, depending on population. Solid Waste Management (SWM) Program approval of operations was required, but local governments issued the licenses.

#### The Seventies

By 1970, MDHES had approved only 10 landfills. State-wide compliance was evidently not achieved by 1974, because in 1977, MDHES again set a goal of closing dumps and upgrading disposal sites to sanitary landfills by 1983.

As a distinct Solid Waste Management (SWM) Program took shape within MDHES in the early 1970's, the move toward consolidation and closure of dumps continued. By 1975, Montana had 227 known municipal solid waste (MSW) disposal sites, of which 102 were judged by the SWM Program to be in general compliance with operating criteria. However, only 11 actually had local licenses. The SWM Program took over the responsibility of

issuing licenses in 1978. By 1979, 87 licenses had been issued, 35 of which were conditional licenses requiring closure or compliance by the end of the year.

The SWM Program was active and stable throughout the 1970s. With the help of matching funds from the U.S. Environmental Protection Agency (EPA), the program consisted of five or six people who traveled the state offering assistance on landfill operation and design, providing operator training, and inspecting sites.

The 1975 Montana State Legislature authorized a state-wide solid waste management study. That study, completed in January 1977, recommended the development of comprehensive state-wide solid waste management services. It suggested a regional strategy based on transfer stations and three waste-to-energy incinerators. During the late 1970s, money was also appropriated to about half the counties in Montana for local and regional planning. One waste-to-energy incinerator was built in Livingston, and continued consolidation of landfills and implementation of container/transfer systems was evident during this time.

As a result of the state-wide study, the legislature made major revisions to the Solid Waste Management Act in 1977. The new laws established mechanisms for the state to provide financial and technical assistance to local governments in the formation and implementation of solid waste management systems. They made it clear that local governments could design, finance, construct, own, and operate solid waste management systems; enter into agreements for marketing recovered materials; or contract for any of these services.

The new laws also required a state solid waste management plan. The SWM Program completed a short plan outlining remedial measures to upgrade disposal sites, and offering model procedures for planning and implementation of area-wide waste management systems. The plan was later submitted to EPA to meet the requirements of the federal Resource Conservation and Recovery Act (RCRA).

### The Eighties

The activity of the 1970s gave way to a trimmed-down program of the 1980s. Federal funding stopped and the state budget got tighter. The state's general fund supported only one or two people in the SWM Program during the decade, and the program operated in a maintenance mode.

The national solid waste crisis of the late 1980s, typified by Islip, New York's wandering garbage barge, initially did not have much impact on Montana's SWM Program. Landfilling was convenient and cheap, and with Montana's wide open spaces, it seemed as though it could continue that way indefinitely. The dry climate and clay soils in much of the state also favored landfilling and seemed to minimize most environmental concerns.

However, in 1988, under the authority of RCRA, the EPA proposed draft regulations in 40 CFR Part 258, commonly known as Subtitle D Regulations. The new rules, which set minimum technical requirements for municipal solid waste landfills (MSWLFs), promised to have a major impact on waste disposal in Montana and the shape of the SWM Program.

The waste crisis came home to Montana when inquiries were made about the potential for importing large amounts of out-of-state waste for disposal. State government and the public began asking more questions. "Were Montana's landfills and its incinerator designed well enough to safely accept a large influx of waste and still protect the public health and the environment? If not, were they really safe enough for our own waste? Shouldn't other states be able to deal with their own waste through reduction and recycling? If so, could Montana be doing more, too?"

In 1989, the Montana Legislature imposed a moratorium on the importation of waste into Montana, and directed the Environmental Quality Council (EQC) to complete an interim study on solid waste management. The legislature also required MSWLFs serving an area with a population of 5,000 or more to implement ground water monitoring, and authorized one additional employee in the SWM Program.

### The Nineties

The year 1991 brought many changes. The EQC report made 38 recommendations regarding solid waste, and drafted 11 bills for the 1991 legislature incorporating those recommendations. A total of 30 bills dealing with solid waste were introduced at the legislature. Eighteen of them passed<sup>4</sup>, including nine of the EQC bills. The legislature authorized license application fees and annual license renewal fees for waste management facilities. The funds were used to upgrade the State SWM Program in preparation for gaining EPA approval for implementation of the provisions of the federal regulations 40 CFR Part 258 and to support the state planning effort. The program now employs 14 people.

## HISTORY OF RECYCLING<sup>5</sup>

Recycling in Montana began on an organized scale in 1916 when Carl Weissman began buying and selling buffalo bones, furs, steel scrap, and junk car parts. In 1919, Pacific Hide and Fur Depot opened operations in the state with the merchandising of furs and scrap metals. As the needs of Montanan's changed, these recyclers expanded their list of commodities bought and sold. Weissman began selling new auto parts, pipe, steel and supplies during the 1930's as repeat orders indicated that there was a demand. Pacific Hide and Fur expanded into new steel sales in the early 1950's.



Montana Recycling, Inc. deviated from the established industrial recycling and pioneered household recycling operations in 1971. They initially concentrated on home generated recyclables such as aluminum cans and bottles. Paper products and non-ferrous scrap were added as facility space and markets allowed. Since recycling was a new subject, educating the public about recycling through tours and presentations became an important part of Montana Recycling's operations.

During the 80's and 90's, the increase in recycling escalated in Montana along with the rest of the nation. Households and offices began choosing to save their recyclables rather than throw them in the trash. This encouraged the established recyclers to attempt to expand the commodities accepted. Additional private buy-back centers, both for-profit and not-for-profit, opened in many Montana towns.

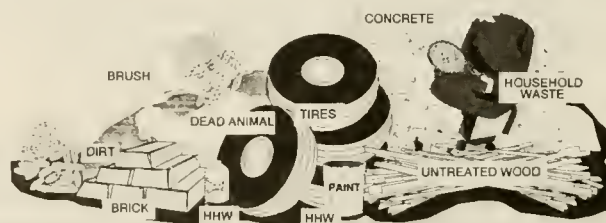
Weissman and Sons, Pacific Steel and Recycling, and Montana RecycleNow (formerly known as Montana Recycling) continue to service the state of Montana. The commodities accepted for recycling have expanded to include aluminum cans, metal scrap, glass, paper, old appliances, tin cans, and some plastics.

## CURRENT CONDITIONS

While source reduction, reuse, recycling, composting, and incineration all play a role in solid waste management in Montana, most municipal waste is landfilled. Class II facilities are designed to accept municipal solid waste and non-hazardous industrial wastes. Standards for site selection, design, and operation of Class II landfills are discussed in Chapter 3.

Unless otherwise indicated, the use of the word "landfill" in this document refers to Class II landfills, also known as municipal solid waste landfills (MSWLFs).

Class III landfills are less restrictive in design, siting, and operation than Class II landfills. They may accept only essentially inert wastes such as concrete, rock, brick, tires, dirt, and untreated wood.



Because measurement of waste has not been a priority for the state due to limited resources, reliable data related to each management method is not available. The Solid Waste Management (SWM) Program acknowledges that the data is imprecise, but estimates that more than 93% of Montana's waste is landfilled, less than 5% is recycled<sup>6</sup>, and less than 2% is incinerated.<sup>7</sup>

### Solid Waste Generation

In 1991, disposal facilities reported receiving 743,631 tons of solid waste. Class II landfills (MSWLFs) accounted for 698,614 tons, Class III landfills for 32,111 tons, and the incinerator for 12,906 tons. This translates into a waste disposal rate of 5.1 lbs/person/day.<sup>8</sup> In addition, 29 open burn permits were issued to landfills in 1991 by MDHES' Air Quality Bureau. The amount of wood waste disposed of in this manner has not been measured. In 1992, disposal facilities reported receiving 713,866 tons of solid waste, which is the equivalent of 4.8 lbs/person/day (see Figure 1).

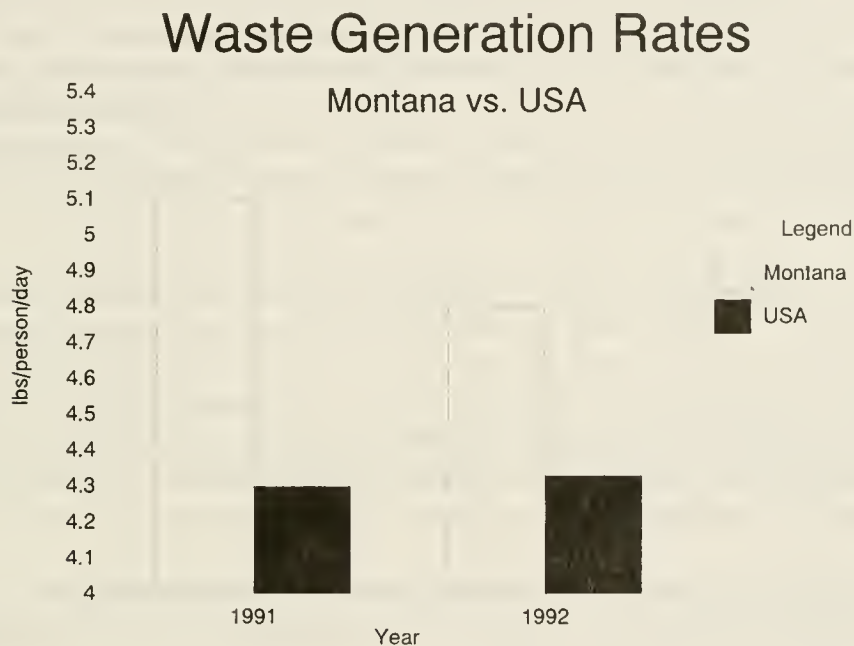


Figure 1. Garbage disposal rates in Montana compared to the United States of America.

Solid waste quantities as reported do not include the processing and recycling of scrap metal, paper, plastic, glass, or textiles, or the use of materials produced from such processing and recycling to make a new product.

### Waste Composition

The SWM Program has not conducted a waste composition study since 1975. The composition of waste has probably changed during the past two decades, making the data unreliable for current use. The 1975 study indicated that Montana's garbage was similar in

composition to national figures published by the EPA at that time.<sup>9</sup> In the absence of recent studies, Montana will need to rely on data from national or other states' studies.<sup>10</sup>

### Disposal Facility Data

As of late December 1993, 73 Class II waste management facilities or systems are licensed by the state. In various combined systems, these licenses include 59 landfills (57 are active; two are licensed but presently under construction), eight transfer stations, two sewage sludge injection sites, one incinerator, one resource recovery facility, and two composting operations.

Of the 59 licensed landfills, 20 to 25 are anticipated to close by late 1994. The SWM Program expects that by January 1995, there will be 30 to 40 licensed, active Class II landfills in Montana. At most of these landfills, officials will be upgrading various design and operational features during 1994 to come into compliance with the technical changes and deadlines required by Montana's permit program, which is an approved counterpart program that meets the standards of the Environmental Protection Agency's Subtitle D Regulations (see, Chapter 3).

In addition to the 72 licensed systems or sites, 80 - 85 sites have been officially closed during the history of the SWM Program. Program officials are also aware of several illegal dumps, either active or inactive, that were never licensed. These sites are relics of former days, and most could not be licensed under current siting criteria. Any disposal activity at such sites is clearly in violation of MDHES rules. SWM Program officials have worked informally with local officials, offering technical assistance to help these facilities close. The SWM Program may use enforcement action when there is continued failure to comply.

As of December 1993, there were also 36 licensed Class III waste disposal sites, consisting of 35 landfills and one resource recovery facility. Twenty-eight Class III sites have officially closed during the history of the SWM Program.

### Industrial Wastes

The 1991 legislature passed a law requiring certain industries which were not regulated by other boards or agencies, to discard their non-hazardous solid wastes in a licensed facility. Up until that time, they had been allowed to discard these wastes on their own land without regulation by MDHES. The Industrial Waste Program is just getting underway, and little data has been collected. The waste generation data discussed previously do not include most industrial sources. It is likely that the SWM Program will license a number of new industrial waste landfills in 1994 and 1995. This will have a large impact on waste generation and waste composition data. Industrial wastes are discussed briefly in Chapter 13.



### Source Reduction and Reuse

To date, source reduction and reuse have not been given priority or funding by the Montana Legislature or the SWM Program. The major state-supported efforts in this regard have been accomplished by the Montana State University (MSU) Extension Service which has been active in solid waste educational programs since 1989. MSU Extension Service personnel have coordinated a Montana Waste Education Coalition, produced information sheets and school curricula, sponsored shopper awareness programs, and provided workshops. The SWM Program has provided some financial support for these activities.

Reuse activities in the form of backyard sales and second-hand stores thrive in Montana. There are various educational programs related to source reduction and reuse, conducted by state-wide environmental groups and local citizens groups in the state. A partial listing of these appears in Appendix C.

No one has measured the impact of source reduction and reuse on waste generation or disposal in Montana. Such measurement would be difficult. It would be a matter of trying to measure waste which has never been generated. The SWM Program cannot reasonably expend its limited resources in such measurement activities at present.

### Recycling and Composting

Recycling involves the collection, storage, sorting, shredding, shearing, baling, and chipping of recyclable material, including but not limited to glass, paper, plastic, metal or textiles. The state is served by about 50 private and non-profit recycling centers in 27 cities and towns. About 20 of these facilities are non-profit organizations providing employment to special populations. They may pay for delivered materials, but many accept donations only. The remaining private recyclers operate buy-back centers, often handling a full range of materials.

Due to Montana's small population and great distance to markets, few municipal recycling collection programs have developed. In the few cities which have collection programs, only a small segment of the population is served, usually by a volunteer-run program or a subscription service. Two Montana communities are implementing blue bag programs, where recyclables are collected with the garbage and sorted out later. The success of these programs has not been documented.

MDHES administers a recycling program for junk vehicles. Since 1973, a vehicle registration fee has provided funds for counties to operate the program. It eliminates junk vehicles from the solid waste stream and conserves natural resources through recycling. About 6,300 tons of vehicles were crushed through the program in 1991. Junk vehicles are not included in the recycling rate, or the waste generation and disposal figures.

State government implemented an in-house office recycling program in 1990 which was expanded under the Integrated Waste Management Act. The Act requires each state agency, university, and the legislature to implement waste reduction and recycling plans. The plan must provide for collection of office recyclables, composting of yard waste, and purchase of recycled materials. A Market Development Task Force has been established to identify and make recommendations to overcome barriers to increased procurement of recycled materials.

A second group of the Market Development Task Force began meeting in September of 1992. The task force is focused on increasing recycling efforts for particular commodities by coordinating transportation mechanisms and involving private industry in overcoming the barriers.

There are two composting operations licensed in Montana. The privately-run facilities co-compost sewage sludge and wood wastes using an aerated static pile method. Ten other communities have indicated that they are beginning to compost yard wastes at currently licensed solid waste management facilities (see, Appendix D). A municipal compost training seminar sponsored by the MSU Extension Service in May 1992 was well-attended and enthusiastically received. Many other communities are considering yard waste composting in the near future.

With the exception of the junk vehicle program and the state government office recycling program, there are no legislative mandates for recycling or composting. No state laws banning specific waste from landfills have been enacted.

### Incineration

One incinerator has been licensed in Montana and has been operating in Livingston since 1981. One of the primary reasons for the incinerator was to control blowing litter in a high-wind area. The incinerator was designed to burn 72 tons of waste per day and to recover energy. For five years it sold steam to the Burlington Northern locomotive rebuild shops. Since Burlington Northern ceased operation in Livingston in 1986, energy recovery has also ceased. The SWM Program received two applications for medical waste incinerators in 1990 and one in 1993. All applications have been withdrawn.

### Endnotes

4 See, Summary of New Solid Waste Legislation, October 13, 1992 in Appendix G

5. Information for this section was gathered by Doug Stewart of Montana Recycling, Inc



PROPOSED FINAL SOLID WASTE MANAGEMENT PLAN \* \* June 1, 1994

6 Michael Lightle, "The state of the state: recycling in Montana," *Resource Recycling*, March 1991. Keep Montana Clean and Beautiful, Inc. Mr. Lightle estimated that 36,500 tons of recyclable materials were recovered in Montana in 1989. The available waste generation data in 1989 was simply a projection from a 1975 study. Using that data, the recycling rate amounted to 6.2% of the waste stream. If Mr. Lightle had access to more accurate waste generation data which was not available until 1991, the recycling rate would have been 4.7%.

7 The landfill and incineration data was collected from the Renewal Applications for Solid Waste Management Systems licenses for 1992.

8 There are many reasons to question the accuracy of this waste generation data. See, Appendix F for more discussion.

9 Henningson, Durhan & Richardson, *State Solid Waste Management Strategy*, prepared for the State of Montana Department of Health and Environmental Sciences, December 1976.

10. See, Appendix F. See also, *Characterization of Municipal Solid Waste in the United States - 1992 Update*, U.S. EPA, EPA-530-S-92-019, and, *Washington State Solid Waste Management Plan*, January 1991, Washington State Department of Ecology.



## **CHAPTER 3. RESPONDING TO 40 CFR PART 258 (SUBTITLE D REGULATIONS)<sup>11</sup>**

### **SUMMARY OF REQUIREMENTS**

Federal regulations 40 CFR Parts 257 and 258, commonly known as Subtitle D regulations, were adopted October 9, 1991. Part 257 was amended slightly to clarify that it applies only to wastes from non-municipal sources as discussed in Chapter 13. Part 258 applies to municipal solid waste landfills (MSWLFs). It sets forth minimum criteria for location, operation, design, ground water monitoring and corrective action, closure and post-closure care, and financial assurance. The criteria affect both new and existing landfills. The requirements are self-implementing, meaning that they go into effect on prescribed dates, and landfill operators are required to comply, even if the state program does not adopt the rule.

Under the original Subtitle D regulations, the deadline for all MSWLFs to comply with a variety of criteria was October 9, 1993. However, in August 1993, the U.S. Environmental Protection Agency (EPA) adopted a rule that extended certain effective dates. The extension provides smaller landfills with additional time to implement required measures. Under EPA's ruling, the effective date of financial assurance requirements for all MSWLFs was delayed until April 9, 1995. The rule also gives MSWLFs that stopped receiving waste before April 9, 1994 until October 9, 1994 to complete their cover installations.

The rule also postponed the effective date for certain small MSWLFs to meet several design and operational requirements. The extension is provided to existing MSWLFs and doesn't apply to new landfills or new units of existing landfills. New landfills must comply by October 9, 1993.

Under EPA's new ruling, Montana's large MSWLFs (those that receive more than 100 tons of waste a day) are required to comply by October 9, 1993 with the regulations for liner design, leachate collection, methane monitoring, and waste screening, and to comply with several other criteria, which will be phased in over a number of years. For Montana's small MSWLFs (those that receive less than 100 tons a day), the date for complying with the liner design, leachate collection, waste screening, and methane monitoring requirements was extended until April 9, 1994.

EPA's prior rule contained a small community exemption from ground water monitoring requirements for certain landfills located in semi-arid regions. As a result of suits filed against EPA by the Sierra Club and Natural Resources Defense Council, the U.S. Court of Appeals ruled in mid-1993 that ground water monitoring is required of all MSWLFs regardless of size. EPA's extension for the Subtitle D requirements incorporates the mandatory ground water monitoring provisions and gives small MSWLFs that were previously exempt from monitoring additional time to comply.

In November 1993, the Solid Waste Management (SWM) Program updated its proposal for Montana's counterpart program to include EPA's new ruling regarding extended deadlines and ground water monitoring changes. In December 1993, EPA approved the regulations adopted by the State of Montana as a counterpart to 40 CFR Part 258. This means Montana's program conforms with the substance of the Subtitle D regulations and provides the state with the authority to regulate the criteria for the design, siting, operation, ground water monitoring, and closure of MSWLFs in Montana. EPA's approval allows the state certain flexibility in adopting alternative standards and schedules for some of the criteria. The state has demonstrated the variances designed into Montana's counterpart program meet the minimum requirements and extended deadlines of 40 CFR Part 258.

The following sections summarize the criteria in Part 258 and compare them with Montana regulations to identify the ways in which the Solid Waste Management (SWM) Program has sought flexibility in the EPA approval process. For all criteria, the SWM Program has sought the maximum flexibility allowed by the EPA, while maintaining standards that protect the public health and the environment.

#### Location Criteria (Subpart B)

Municipal solid waste landfills (MSWLFs) cannot be located or operated in wetlands, floodplains, fault areas, seismic impact zones, or unstable areas. If they are located within 10,000 feet of the end of an airport runway used by turbojets, or 5,000 feet in the case of airports used by piston-type aircraft, owners or operators must demonstrate that the landfill does not pose a bird hazard to aircraft.

An approved state may locate landfills in wetlands, fault areas, and seismic impact zones, if certain specified conditions are met. The state may also extend closure deadlines for existing landfills located in these areas. In Montana, it is not difficult to avoid wetlands, airports, floodplains, and faultlines in choosing a site for a new landfill. However, much of western Montana lies in seismic impact zones. As an approved state, the SWM Program has the authority to approve landfills in seismic impact zones if all containment structures are designed to adequately resist the expected movement of the earth. For existing landfills which may lie in restricted areas, the SWM Program has the authority to extend closure deadlines or allow continued operation in the event that the sites can be engineered to address these issues. The SWM Program will evaluate existing and future landfills on a site-specific basis.

#### Operation Criteria (Subpart C)

Owners and operators of municipal solid waste landfills (MSWLFs) must comply with ten operational standards. 1) They must implement procedures for prohibiting the disposal of regulated hazardous wastes and PCB wastes, including random inspections of incoming loads,



records of inspections, training of workers to recognize hazardous and PCB wastes, and notification of unauthorized disposal. 2) They must cover disposed waste with six inches of earthen material at the end of each operating day or more frequently if necessary. 3) They must prevent or control populations of disease vectors. 4) They must ensure the concentration of methane gas generated by the landfill does not exceed set limits, by implementing methane monitoring programs. When the methane exceeds the limits, they must take necessary steps to protect human health and must notify the state. 5) They must ensure that the landfill meets all applicable air quality standards, and may not conduct open burning of mixed MSW. 6) They must control public access and prevent unauthorized traffic and illegal dumping. 7) They must design units to prevent run-on to the active portion of the landfill during the peak of a 25-year storm, and to collect and control run-off from the active portion of the landfill in the event of a 24-hour, 25-year storm. 8) They must prevent the discharge of pollutants into any water in violation of federal or state standards. 9) They must not accept bulk, non-containerized, or large containers of liquid wastes except under certain circumstances. 10) They must record and retain information relating to all aspects of ARM 16.14.521.

On October 9, 1993, new MSWLFs and lateral expansions to large landfills must meet the waste screening and methane monitoring requirements. Small MSWLFs must meet the waste screening and methane monitoring requirements by April 9, 1994.

An approved state may approve alternative cover material at alternative thicknesses, may temporarily waive cover requirements during extreme climatic conditions, may establish alternative schedules for methane gas remediation, and may set alternative schedules for record keeping. Montana regulations already include many of these operational requirements. The primary new criteria are random inspections for hazardous waste, methane monitoring, run-on/run-off controls, and recording keeping. 40 CFR Part 258 does not allow states to waive any of these requirements.

Under ARM Title 16, Chapter 14, Subchapter 5, the SWM Program has the authority to approve alternate daily cover that meets performance standards, provide some flexibility governing the number and location of methane monitoring wells, and approve alternative waste screening methods if the landfill operator is able to insure that incoming loads do not contain regulated hazardous or PCB-containing waste.

#### Design Criteria (Subpart D)

The criteria are based on design standards, meaning that a certain technology must be employed which has been proven to be protective of human health and the environment in most circumstances. The requirements call for a composite liner and leachate collection system for any new landfill or a lateral expansion of an existing landfill. A composite liner consists of two components, a layer of compacted soil and a flexible membrane liner of 60-mil high density polyethylene.

As of October 9, 1993 (under ARM 16.14.506), new MSWLFs and lateral expansion to large landfills are required to meet the requirements for the installation of a liner and leachate collection system, unless the landfill has been approved for a small community exemption (see, p. 31). The same regulation also requires lateral expansions to existing small landfill units to install a liner and leachate collection system after April 9, 1994.

An approved state may accept an alternative design based on performance standards, allowing use of any technology that the applicant demonstrates is protective of the environment in site-specific circumstances. ARM 16.14.506 gives the SWM Program authority to approve options for liners--the composite liner, a liner consisting of compacted soil amended with clay, a no liner option requiring scarification and recompaction of existing soil. An option that holds promise for Montana facilities where natural clay soils are unsuitable, is a geosynthetic clay liner. The SWM Program has the authority to approve various low-cost options for leachate collection systems depending on site-specific circumstances. The design of liners and leachate collection systems will depend on the given set of geologic conditions at each site.

#### Ground Water Monitoring and Corrective Action (Subpart E)

On October 9, 1993, a) new municipal solid waste landfills (MSWLFs) and b) existing MSWLFs that serve a population of 5,000 or more people became subject to new regulatory requirements governing ground water monitoring. (See, ARM 16.14.701.) Ground water requirements are imposed on existing MSWLFs that serve less than 5,000 people after April 9, 1994, in accordance with the following dates: facilities less than one mile from a drinking water intake will begin monitoring on October 9, 1994; facilities located 1 to 2 miles from a drinking water intake will begin monitoring on October 9, 1995; and facilities located more than 2 miles from a drinking water intake will begin monitoring on October 9, 1996.

A ground water monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer. The system must include sampling of wells up-gradient and down-gradient from the landfill. The operator must conduct monitoring semi-annually over the life of the landfill and post-closure period. Samples must be analyzed for at least 17 heavy metals and 47 volatile organics. When elevated levels are detected, the operator must implement an assessment monitoring program as specified in ARM 16.14.706-708. When ground water standards are exceeded, the regulations prescribe a corrective action program.

As an approved state, the SWM Program has the authority to suspend monitoring requirements if the owner or operator can demonstrate that there is no potential for migration of hazardous constituents to ground water. The state has established monitoring schedules and frequencies, specified the location and number of wells, approved alternative systems,

established a list of constituents and parameters for monitoring, established ground water protection standards, established schedules for remediation, and identified criteria for determining when remediation is not necessary.

Montana regulations include an exemption for operators who can demonstrate that there is no potential for migration of hazardous constituents. The SWM Program has prepared state regulations to define the monitoring parameters and incorporate Subtitle D requirements for assessment monitoring and corrective action.

#### Closure and Post-closure Care (Subpart F)

Under ARM 16.14.530-531, on October 9, 1993, all MSWLFs must prepare and submit for approval to the SWM Program a closure and post-closure plan. Owners and operators of municipal solid waste landfills (MSWLFs) must install a final cover "designed to minimize infiltration and erosion, prepare a written closure plan and place it in the operating records, notify the state when closure is to occur, and make a notation on the landfill deed that landfilling has occurred on the property".<sup>12</sup> Design features of the final cover system are specified in the regulations. The owner or operator must write a post-closure plan which maintains the integrity and effectiveness of the final cover, the leachate collection system, the ground water monitoring system, and the gas monitoring system for a period of 30 years following closure.

As an approved state, the SWM Program may allow an alternative final cover design that meets the criteria and may approve extensions of deadlines for closure under certain conditions. The SWM Program also has the authority to increase or decrease the post-closure monitoring period, and has the flexibility to allow an owner or operator to suspend monitoring. Montana regulations already require a closure plan and inspection. The SWM Program has revised its regulations to meet 40 CFR Part 258.60 performance standards. Because the recommended national design standards cannot take Montana's climate and geology into account, the SWM Program has sought flexibility in this area. The SWM Program will continue to evaluate the need to increase (or any requests to decrease) the post-closure monitoring period on a site-specific basis.

#### Financial Assurance (Subpart G)

On April 9, 1995, owners/operators of municipal solid waste landfills (MSWLFs) are required, under ARM 16.14.540, to have a detailed written estimate, updated annually, of the costs to have a third party perform closure, post-closure care, and any corrective action. They must provide assurance that they can cover these costs through trust funds, insurance policies, surety bonds, letters of credit, a corporate financial test, a local government financial test, a corporate guarantee, a local government guarantee, or a combination of these.



As an approved state, the SWM Program may allow any other mechanism of financial assurance that satisfies the criteria. The SWM Program has requested the flexibility to allow local governments to claim financial assurance based on a formal pledge of taxing and bonding authority. In late December 1993, the EPA issued proposed rules for including two financial assurance mechanisms in addition to those mentioned in the paragraph above. EPA has proposed a local government financial test and a local government guarantee. Also the proposed rule would allow landfill owners and operators to use a combination of methods for assuring the costs associated with their MSWLFs. The final rule on what will be required of local governments is expected by mid-1994.

#### Small Landfill Exemption (Subpart A)

Small municipal solid waste landfills (MSWLFs) that meet all the following criteria may be exempted by the SWM Program from ARM 16.14.506 (the design criteria):

- 1) receive less than 20 tons of waste per day on an annual average;
- 2) have no evidence of existing ground water contamination from the landfill;
- 3) receive 25 inches or less of precipitation per year; and
- 4) serve a community for which no practicable waste management alternative exists.

As an approved state, the SWM Program has the authority to revoke an exemption if any ground water contamination is found or if any of the required conditions can no longer be met.

All location, operation, closure and post-closure care, ground water monitoring and corrective action requirements contained in Montana law still apply. Those landfills that have been granted a small community exemption are required by October 9, 1995 to comply with all financial assurance requirements (see, Financial Assurance above).

According to the EPA, ground water contamination may be evidenced by impacts to nearby wells or stressed vegetation.

The SWM Program considers the term "practicable waste management alternative" to mean a complying MSWLF, transfer station, or materials recovery facility within the region which can accept the waste which would otherwise be going to the landfill in question. ARM 16.14.506(16) identifies that if there is a complying facility within 100 miles that can be used at a cost per year of less than 1% of the median household income for the area, that is considered a practicable alternative. If the cost of the complying with the criteria for landfill design and operation exceeds 1% of the median household income a year, that is not a "practicable alternative".



As an approved state, the SWM Program is not allowed flexibility in the area of the small landfill exemption. The SWM Program believes that the small landfill exemption will not be highly used in Montana for several reasons. First, the SWM Program has the flexibility to approve alternative design criteria based on geologic features. This flexibility is more protective of the environment than exemptions based on size. Second, the costs associated with ground water monitoring, methane monitoring, and financial assurance under ARM 16.14.501-540 will force small landfills to close and regionalize, so there will be few remaining. Third, while many landfills may meet the first three criteria, most communities will have a "practicable alternative".

### PROGRAM APPROVAL

In order to gain program approval, the Department adopted a combination of the federal standards and Montana-specific design standards and/or performance standards for municipal solid waste landfills (MSWLFs). The EPA has examined Montana's solid waste regulatory and licensing programs and has determined they are adequate to ensure compliance with 40 CFR Part 258. The SWM Program published a final draft of its revised rules in May of 1993, submitted its request for program approval to the EPA in June of 1993. In November 1993, the SWM Program prepared and published technical and date changes to Montana's counterpart program that incorporated EPA's August 1993 rule amending certain Subtitle D requirements (see, p. 27). In December, 1993, EPA published its Notice of Program Approval (for Montana's program).

As an approved state, the SWM Program will continue to regulate all aspects of landfilling in Montana and will take advantage of all areas of flexibility described above. The Department's purpose in gaining program approval has been to enforce regulations which provide the equivalent or greater protection to human health and the environment as those afforded by 40 CFR Part 258, but which allow maximum flexibility in achieving those standards in Montana's unique situation.

### QUESTIONS AND DISCUSSION FOR LOCAL DECISION-MAKERS

1. As an official who is responsible for a small landfill, shall I close it before April 9, 1994 and haul the waste to another landfill?

You need to be aware that as of October 9, 1993, stricter regulations are now in place for the construction, operation, and closure of Montana's MSWLFs. All landfills must have an approved plan on-line for closure and post-closure. Those facilities serving 5,000 or more people are still required to conduct ground water monitoring.

Before you decide, you will need to explore your options for hauling, and negotiate interlocal agreements and/or contracts. Also, look at your options for roll-off container systems, transfer stations, or materials recovery facilities (MRFs). You may wish to implement an integrated waste management system which may include source reduction, reuse, recycling, composting, a transfer station and/or MRF. These may help you lower the amount of waste you need to haul, and thus your costs. The costs vary according to your local conditions and options, as well as the new regulations that apply to your site.

2. As an official who is responsible for a small landfill, shall I close it before April 9, 1994 and open a new one?

On April 9, 1994, MSWLFs that accept less than 100 tons of waste a day must comply with new requirements for liner design leachate collection, methane monitoring, and waste screening. Also, on April 9, all existing MSWLFs will be required to monitor the quality of the ground water beneath their landfill site, in accordance with a schedule based on the facility's distance from a drinking water intake. If you remain open beyond that date, your landfill is committed to a thorough hydrogeologic study and thirty years of ground water monitoring and post-closure care.

As of October 9, 1993, new MSWLFs, regardless of size, must be designed, and operated according to the new regulations. The cost for opening a landfill that will comply with ARM Title 16, Chapter 14, Subchapters 5 and 7 will vary depending on site-specific conditions. The city/county government of Butte-Silver Bow licensed a 230-acre landfill site in August 1992 which substantially complies with 40 CFR Part 258. Their cost is estimated at \$3.1 million. The active disposal area covers 120 acres and has an expected life of 40 years. The SWM Program approved an alternate liner design rather than requiring a standard, composite liner given the characteristics of that particular site. A standard, composite liner would have increased costs significantly.

The SWM Program has gained program approval from EPA, which allows MSWLFs the flexibility described in the sections above. In terms of the small landfill exemption, tonnage and rainfall are easily determined, and a ground water scientist can help you determine evidence of ground water contamination. In determining "practicable alternatives," if the closest facility that will accept your waste is further than 100 miles and if it costs you more than 1% of the median household income to haul it there, or to upgrade your existing landfill to comply with design and ground water monitoring criteria, you may be able to claim that you have "no practicable alternative".

3. Shall I upgrade my landfill to meet ARM Title 16, Chapter 14, Subchapters 5 and 7?

Costs for upgrading landfills will vary considerably depending on your local conditions. You will need to evaluate these costs for your particular situation. Browning Ferris Industries is currently upgrading a three-acre cell of their landfill in Missoula which meets standards in 40 CFR Part 258, including installation of a modified composite liner. The cost is estimated at \$1 million for the three acres with an expected life of three years.

4. If I am not currently operating a landfill, will I be affected by ARM Title 16, Chapter 14, Subchapters 5 and 7?

ARM Title 16, Chapter 14, Subchapters 5 and 7 apply to municipal solid waste landfills (MSWLFs) only and not to other solid waste facilities. However, disposal rates at the MSWLF where your waste is hauled will likely increase. You may need to make new inter-local agreements or participate in regional waste disposal planning efforts.

5. What happens if I decide to stop accepting waste at my landfill before April 9, 1994?

You will need to comply with the final cover and closure plan requirements. You should begin your closure activities within 30 days of the last receipt of wastes and complete the efforts within six months after the closure efforts start. The cover must meet requirements specified in state regulations.

6. What happens if I decide to keep my landfill open indefinitely?

The landfill will be subject to all existing Montana laws and regulations including all criteria in ARM Title 16, Chapter 14, Subchapters 5 and 7 which contain strict provisions for liner design, leachate collection, monitoring of methane and ground water, waste screening, closure and financial assurance requirements. As these criteria are phased in over a number of months, you should check the regulations to determine the compliance dates for your situation.

## RECOMMENDATIONS

- 1. Offer technical support to landfill managers in implementing ARM Title 16, Chapter 14, Subchapters 5 and 7.**

The SWM Program should strengthen enforcement procedures, examine its level of technical expertise, and provide appropriate training for program personnel. The SWM Program should require all program personnel who license and inspect landfills to take a landfill operator training course.

All landfills must come into compliance with new state regulations which incorporate the requirements of Subtitle D. The SWM Program will give renewed attention to closing unlicensed, poorly-sited, and poorly-operated landfills and old dumps.

**2. Provide resources for local decision-makers.**

Local waste managers and decision-makers need more information and guidance as they try to make good decisions for their communities in light of the state regulation under ARM Title 16, Chapter 14, Subchapters 5 and 7. The SWM Program should produce a decision-maker's guide and technical guidance documents test to aid local waste managers.

Endnotes

11. Information for this section was taken from Environmental Protection Agency, "Solid Waste Disposal Facility Criteria: Final Rule", (40 CFR Parts 257 and 258), *Federal Register*, Vol. 56, No. 196, Part II, Wednesday October 9, 1991, *Federal Register*, Vol. 58, No. 189, Friday October 1, 1993

12. Repa, Edward W., "EPA Promulgates Long-Awaited Landfill Rules," *Waste Age*, October 1991



## CHAPTER 4. LANDFILL CAPACITY AND REGIONALIZATION

**Policies:** Because the planning, location, acquisition, development, and operation of solid waste disposal sites is a matter of state-wide concern, the State of Montana will take an active role in assuring that adequate landfill capacity exists to meet the needs of all areas of the state.

Local government has the primary responsibility for planning for solid waste management. The state has a responsibility to assist local government in establishing solid waste disposal sites.

The state will encourage further regionalization and consolidation of waste management systems to facilitate development of environmentally sound solid waste facilities, and to promote better solid waste planning.

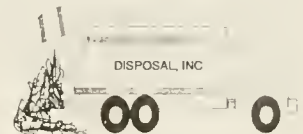
**Goals:** All regions of Montana will have adequate and environmentally sound landfill capacity.

All solid waste management will be regionalized so that Montana has fewer total landfills, which are well sited and well managed.

All levels of solid waste management agencies and private waste management companies will be involved in regional solid waste planning.

### CURRENT LANDFILL CAPACITY

While Montana moves toward waste reduction and a more integrated approach to solid waste management, it is obvious that landfills are and will continue to be an important part of the state's management of solid waste. As the population of Montana grows, the need for sufficient and properly operated waste disposal facilities also grows. Landfill capacity assurance is the process of planning for the future so that local governments and their citizens can be more certain that they will have access to adequate solid waste disposal capacity.



While the need for landfill space is increasing, the difficulty of siting new landfills is also increasing. Although Montana seems to have plenty of space, it may not be available because of environmental or political reasons. Public opposition to nearby landfills is increasing as citizens become concerned about the potential effects of landfills on the environment. It is important to conserve space in properly sited and operated landfills.

Because of the difficulty of siting new landfills, it is increasingly important that citizens, local governments, and the Solid Waste Management (SWM) Program work together to plan for future landfill needs. Everyone involved must be aware of trends in population growth, waste generation rates, new regulations, and other factors that influence the needed and available capacity of landfill space in all regions of Montana.

Because of the lack of accurate record keeping and reporting and the lack of a standard process for estimating landfill capacity, estimates of existing landfill capacity vary too much to be of much use. As more landfills close and others upgrade in the next two years, capacity data will be much easier to obtain.

Meanwhile, by using the information that is available, some general trends are obvious. Due largely to the Montana's regulatory program that meets the requirements of Subtitle D, (see, Chapter 3) many of Montana's existing landfills will be closing soon. The SWM Program estimates that by the end of 1994 there will be approximately 30-40 licensed MSWLFs. For most areas of Montana, landfill capacity will not be a problem in the near future. However, there are some parts of the state which will need additional disposal capacity within five years. Approximately 70% of Montana's municipal solid waste is disposed of in just 14 MSWLFs. The remaining 30% goes into one of the other 43 currently active landfills (59 are presently licensed, but as of December 1993, 57 of them are active; two are being constructed and are not yet accepting waste). If there are 40 MSWLFs remaining in 1995, and the 14 major MSWLFs remain open, each of the 26 other landfills will be burying less than an average of 8,000 tons of waste a year.

## FUTURE CAPACITY NEEDS

The potential land area available in Montana for future landfill sites would seem to be very large. It is, however, finite, and currently unknown. Environmental and geological factors have not been adequately studied, and political and social factors are difficult to predict. The only measure of landfill capacity that can readily be determined is licensed capacity for given regions.

At current waste generation rates, all of Montana's major population centers, except for the Flathead Valley, have adequate licensed landfill capacity for at least 20 years. The Flathead Valley has two major landfills that are both expected to be filled in about eight years. Plans for expansion are under way.

Assuming that population and waste generation in Montana continue to increase gradually, the existing disposal capacity could be significantly reduced. Although Montana's population increased only 1.6% between 1980 and 1990, many regions of the state have experienced higher growth rates, particularly around Billings, Missoula, the Flathead Valley, in portions of

Gallatin and Madison Counties, and on many Indian reservations. Most of these areas have seen annual population growth near 2% each year. These areas need to be particularly concerned about future capacity.

#### Solid Waste Importation Into Montana

In the past few years, large population centers outside Montana have proposed transporting and disposing of large quantities of waste in Montana. The Montana Legislature prohibited the importation of waste into Montana from 1989 to August 1, 1993. In 1993, the Legislature passed an act that requires a fee on the disposal of any out-of-state waste imported into the state. DHES has established a per ton fee for the incineration and disposal of imported wastes that is based on the actual direct and indirect cost to the state for administering the solid waste laws and rules in relation to these wastes. Presently that fee is set at \$.27 per ton of waste, in addition to the standard volume based fee of \$.31 that Montana solid waste facilities must pay to the SWM program. The \$.27 fee applies to all municipal solid waste facilities that accept out-of-state waste from August 1, 1993 until July 1, 1995. After July 1, 1995, the \$.27 per ton out-of-state waste fee applies only to those disposal facilities that accept less than 25,000 tons of waste on annually. After July 1, 1995 all incinerators and other disposal facilities will be assessed a legislated \$5.00 a ton out-of-state waste fee. Presently, such differential fees on out-of-state waste are being questioned in the Supreme Court as being in conflict with Interstate Commerce. The 1995 Legislature may choose to re-address Montana's out-of-state waste fees.

Accepting waste from other states increases the potential for Montana's natural resources, as well as its citizens, to be impacted. Solid waste disposal unavoidably causes some environmental, social and economic impact, both beneficial and harmful. It also has the potential to discourage recycling in the state where the waste originates. By providing cheap land for waste disposal, Montana would relieve the pressure that drives recycling in other states.

The effect of waste importation on licensed capacity cannot be determined in the absence of a specific and concrete proposal. Past proposals have all included plans to develop and operate a completely new landfill. As landfilling costs rise around the U.S., Montana can expect more inquiries about waste importation.

### REGIONALIZATION

Regionalization is a systematic way to effectively plan for the current and future solid waste management needs of Montana. An important aspect of solid waste planning is assuring that all regions of the state have, and will continue to have sufficient and environmentally sound



waste disposal capacity. Communities with good facilities, both transfer stations and landfills, will need to accept other communities' waste. Local politics, policies, and sentiment which may restrict the movement of waste to these facilities must be overcome in favor of good planning.

Planning, complete with long-range goals, supported by detailed projections, based on accurate waste generation rates and capacity information, is a much more proactive approach than has been taken previously in Montana. The result will be a more efficient and reasonable planning process for facility siting which estimates future operating costs, and anticipates other waste management decisions.

Solid waste management in Montana has been characterized by a piecemeal approach which can result in a never-ending series of crises. The function of planning is to see that short-term solutions do not create needs and justifications of their own which interfere with long-term solutions. Inadequate solid waste planning can result in frantic and often unsound emergency actions which can affect generations to come.

There are several approaches to developing effective regional solid waste systems. Regionalization requires that decision-makers work together to plan for waste management for an entire region rather than for a single community or county. Waste managers and elected officials collect information and follow trends in population growth and waste generation rates in order to estimate how much disposal capacity a given region will need for the future. The key to any approach is that all affected parties in a given region work together to plan and implement such a system.

In the past, the SWM Program has designated waste management regions across the state. The regions, however, had little impact on waste management planning and have been abandoned. The SWM Program could try to establish more effective planning regions or "wastesheds". Another approach would allow local governments to work out their own regions, but require all communities to be part of a regional planning effort. The Solid Waste Plan Advisory Committee (SWPAC) rejected both these approaches in favor of locally directed planning. Because local communities hold primary responsibility for solid waste planning and are better situated to make decisions on regionalization, this plan recommends that the state assume an advisory role only in the regionalization process.

#### Environmental Issues

Regionalization will result in fewer landfills, decreasing the risk of contaminating soils and ground water, and impacting fisheries and wildlife populations. These landfills will provide more environmental protection because they will be better sited, better operated, and better monitored. Increased transportation of waste, resulting from regionalization, will mean greater use of fossil fuels, more impact on roads, and more likelihood of solid waste spills.



### Economic Issues

Assuming municipal solid waste landfills (MSWLFs) come into full compliance with 40 CFR Part 258, it will be cheaper for many towns to ship their waste to a regional facility rather than operate their own landfill. State-wide, transportation costs associated with regionalization will probably increase, but landfill development and monitoring costs will be lower because fewer facilities will be maintained. Fewer solid waste management systems should mean that the SWM Program will need to devote fewer resources siting and inspecting facilities in the future.

### Barriers to Capacity Assurance and Regionalization

1. State and local governments lack reliable data on waste disposal, recycling, and available disposal capacity.
2. There is a lack of consistent long-range planning for solid waste management.
3. Opposition to new or expanded solid waste disposal facilities is increasing.
4. Various types and levels of solid waste planning make coordination difficult. Differing goals and objectives often work against one another to result in a much less effective overall system.
5. Some local governments may be unwilling to give up control over solid waste planning and implementation.
6. Some private waste contractors may be unwilling to be part of a waste planning region or district.
7. Economics of waste transportation may make the costs of regionalization prohibitive in some areas.

## RECOMMENDATIONS

1. **Require all solid waste facilities (landfills, incinerators, recycling centers, and composting facilities) to record and report accurate data on existing landfill capacity, disposal rates, recycling rates, and waste reduction rates.**

Records of the amounts and types of waste accepted at landfills and incinerators are crucial in determining future capacity and regional planning in the state. The amounts of materials recycled and composted will have an effect on landfill capacity and are needed to help

measure waste reduction goals. All solid waste facilities should have scales or other accurate means of estimating the volume of waste or materials they process, and in the case of landfills, their remaining capacity.

The SWM Program should develop and manage a data collection system that will effectively monitor the state's solid waste stream. Each solid waste license holder should be required to make annual reports to the SWM Program that contain data on capacity, disposal rates, and recycling rates. The SWM Program should research measurement methods that other states have implemented and work closely with landfill operators and recyclers to evaluate whether measurement is needed and if so, to establish mechanisms which are consistent, fair, reliable, and confidential.

**2. Plan for regional systems.**

The planning of solid waste management systems is the role of local governments. After considering the economics of regionalization and compliance with 40 CFR Part 248, they should develop the necessary inter-local agreements with other local or tribal governments or contract with private disposal companies to ensure adequate disposal capacity for the future. The SWM Program should encourage regionalization and serve in an advisory capacity for local governments.

**3. Subject waste that is imported into Montana to an additional, but reasonable, per-ton management fee.**

The 1993 Montana Legislature directed the Montana Department of Health and Environmental Sciences to review the \$5/ton fee for importation of out-of-state waste and to set justifiable, legally defensible fees based on direct or indirect cost of accepting imported waste. The SWM Program adopted by rule--in addition to the volume-based, per ton fee that is required--a fee of 27 cents per ton for the incineration and disposal of out-of-state wastes.

**PART II**

**WHERE WE ARE GOING**

**INTEGRATED WASTE MANAGEMENT**





## CHAPTER 5. INTEGRATED WASTE MANAGEMENT

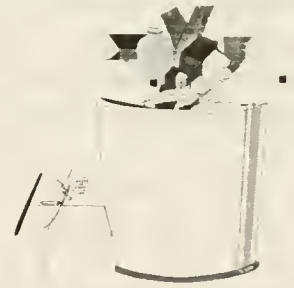
**Policy:** The State of Montana will plan and implement an integrated approach to solid waste management, based on the following order of priority: (1) reduction of waste generated at the source; (2) reuse; (3) recycling; (4) composting of biodegradable waste; and (5) landfilling or incineration.

**Goals:** By 1996, the State of Montana will have reduced by at least 25%, the waste that is disposed of by landfilling or incineration. The rate of reduction will increase each year.

Educational information on integrated waste management will be easily accessible to all citizens through numerous informational resources at the local and state level.

### WHAT IS INTEGRATED WASTE MANAGEMENT AND WHY THESE GOALS?

The U.S. Environmental Protection Agency (EPA) defines integrated waste management as "the complementary use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment".<sup>13</sup> Solid waste decision-makers should evaluate and implement the practices listed in the policy statement above.



As stated in the previous chapter, most waste in Montana is managed by landfilling. This is the 5th or lowest priority method for waste management. In order to shift priorities, decision-makers must start at the top of the hierarchy and evaluate each method in turn. The first consideration is stopping the flow at the source. If waste managers cannot handle a particular waste stream in this way, they should consider reuse, then recycling and composting, and finally landfilling or incineration. Each of these methods is more fully discussed in the following six chapters.

Montana has adopted an integrated waste management policy because in the long-term, it makes sense, environmentally and economically. While landfilling (as it has been done in Montana in the past), may be the cheapest method of waste management, facilities that have failed to observe environmentally sound practices for siting and operation may not adequately protect public health and the environment. Implementing new federal and state regulations to correct these practices is dramatically increasing the costs of landfilling. Waste managers

should recognize that space in well-sited, well-designed, and well-operated landfills is a valuable commodity to be conserved for waste which they cannot handle effectively by other methods.

The cost and effectiveness of source reduction and reuse have not been evaluated for most Montana communities. Many waste experts expect recycling markets to stabilize in the near future. Policy-makers must continually reevaluate recycling options as markets fluctuate. Composting already shows promise as an economically feasible management method for some Montana communities.

Short-term cost-effectiveness is one measure of the usefulness of any waste management method, but it is not the only measure. The integrated waste management process has the potential to conserve valuable energy and resources, to lead to wiser decision-making, to increase community involvement in solid waste management, to enhance protection of human health and the environment, and to create jobs.

As old landfills close and new ones become more difficult to site and more expensive to construct and operate, the disposal of waste has become a growing problem for local waste managers. In order to deal with this problem, the State of Montana has adopted the integrated waste management policy and is asking for cooperation from local and tribal governments, the private sector, and the general public in implementing the policy.

### THE 25% WASTE REDUCTION GOAL

The 1991 Legislature set a 25% waste reduction goal<sup>14</sup> to influence the direction and policy of the Solid Waste Management (SWM) Program, and to inspire action from tribal and local governments, the private sector, and the general public. The SWM Program will attempt to measure that reduction based on weight. Although volume is a more significant measure in terms of landfill capacity, weight is more consistent and therefore comparable. Precise measurement of the goal, while it would certainly help in evaluating policies, tracking progress, and revising plans, is not feasible in Montana at this time. The mechanisms are not currently in place to accurately measure wastes or recyclables. As discussed in the previous chapter, data concerning waste generation are not entirely reliable. Resources have not been committed within the SWM Program to undertake data gathering activities.

Readers should note that the 25% goal is not a recycling goal but a waste reduction goal. In other words, the reduction can take place through recycling and composting, but also through source reduction and reuse. As noted earlier, source reduction and reuse are particularly difficult to measure. Until mechanisms are in place to measure the recovery or reduction of waste attributable to each of these methods, the SWM Program efforts will focus on measuring waste disposal.

## THE PUBLIC EDUCATION GOAL

Changing consumer behaviors and attitudes is key to all types of waste reduction--source reduction, reuse, recycling, and composting. Public education, along with increased waste reduction opportunities, is one important strategy for encouraging this change. It allows local flexibility, is comparatively easy to implement, and when well-done, may be the most cost-effective strategy.

The next six chapters recommend specific strategies for each method of the integrated waste management hierarchy. Public education, however, is common to all of them. Waste managers must support education using all available resources as a part of any integrated waste management strategy they select. A public education campaign can also be an effective waste reduction strategy by itself, even if other new programs or strategies cannot be implemented.

The SWM Program has a mandate<sup>15</sup> to serve as a clearinghouse for information and education on integrated waste management programs for communities. Appendix C contains a list of educational resources.

## RECOMMENDATIONS

Many alternative strategies for implementing specific components of an integrated system will be discussed and assessed in the following chapters. However, some strategies apply more generally to the entire integrated system and are outlined here.

### **1. Increase the number of public education, recognition, and voluntary programs promoting integrated waste management.**

A key to achieving integrated waste management is changing people's attitudes and behaviors. One way to do so is through public education. Currently in Montana, most public education on integrated waste management occurs through the efforts of the MSU Extension Service and the activities of diverse groups such as local citizens' groups, local government task forces, recycling centers and industry groups, and state-wide environmental groups. Waste decision-makers must expand these efforts.

Waste managers should promote source reduction, reuse, recycling, and composting through media and public outreach campaigns, school curricula, consumer workshops and seminars, office waste reduction programs, printed materials, shelf-labeling programs, voluntary goals and standards for integrated waste management, awards programs for waste reduction, waste audits, and letter-writing campaigns. Public education by these methods, can also help



provide information on landfilling and incineration, which are also part of the integrated waste management system. With accurate information, citizens can make more informed decisions about waste management and facility siting.

Educational programs should be implemented at the local level with support from the SWM Program. Local and state officials must work together to devise funding mechanisms. The SWM Program should implement its mandate to be a clearing house for integrated waste management by funding a state-wide media campaign on integrated waste management, increasing the materials and technical assistance available through the SWM Program, and implementing model education programs in several communities. The SWM Program should offer a "green seal" of approval for businesses which implement integrated waste management measures.

**2. Develop local integrated waste management plans and achieve stable funding for their implementation.**

The Montana Integrated Solid Waste Management Plan will not be effective unless its recommendations are implemented at the local level. Each community should implement a process for local planning which emphasizes the integrated waste management hierarchy. Guidelines are given in Chapter 14. The SWM Program should support legislation to fund a grant program to implement local plans that promote source reduction, reuse, recycling, and composting. The SWM Program should meet with local government officials to find acceptable methods for funding integrated waste management projects which are recommended in state and local plans.

**3. Increase public participation in solid waste decision-making.**

Government should involve the public to a greater degree in solid waste decision-making and planning. Local governments should encourage and assist in the development of local advisory boards and volunteer groups. Citizens are encouraged to take every opportunity to attend meetings and public hearings to learn about, help develop, and participate in integrated waste management programs in the community. They may contact local and state officials and urge waste reduction activities in their community.

The SWM Program should increase efforts to include the public by sponsoring more community forums and educational programs, and by continuing to meet the requirements of the Montana Environmental Policy Act for public participation in licensing decisions. The SWM Program should facilitate two advisory committees of representatives of a broad range of interests--one focusing on source reduction and reuse and a second focusing on recycling and composting. The committees would continue to explore integrated waste management issues and help the SWM Program implement and revise this plan.



**4. Implement mechanisms to measure the 25% waste reduction goal.**

If Montana is to assess progress toward the 25% reduction goal, the state must establish and implement more comprehensive mechanisms for measuring waste generation, materials recovery, and other waste reduction methods (see, Chapter 4, recommendation 1, p. 40). In light of current measurement difficulties, the SWM Program will estimate progress toward the 25% waste reduction goal in the following ways until more accurate reporting mechanisms are in place:

1. SWM Program officials will use the 1991 waste disposal total of 743,631 tons as a baseline figure. They will compare this number with disposal data reported each year by landfills and incinerators. The SWM Program will adjust the figures based on estimated population changes, changes in reporting requirements, and any large new industrial waste streams which are added to waste reporting figures. The SWM Program will look for a measurable decline in disposal amounts each year. By 1996, the disposal amount should be 25% less than the adjusted 1991 baseline.

2. The January 1991 report by the Environmental Quality Council to the 52nd Legislature<sup>16</sup> listed 12 integrated waste management projects in Montana and nine additional communities with active citizens groups involved in solid waste issues. The Appendix D of this document contains an additional list. SWM Program will conduct a survey of such projects and groups again in 1994 and 1996, as a measure of movement toward the 25% reduction goal. Waste reduction resulting from activities of such programs should be reflected in those communities' waste disposal figures.

**5. Provide tax incentives for businesses which conduct certain waste reduction activities and for the development of end-use facilities for recyclable materials in Montana.**

Tax credits and deductions can stimulate such activities as the purchase of new equipment for increased source reduction, recycling, or composting; purchase of recycled products for use or resale; product redesign, product line modifications, standardization of products and parts; and research and development into integrated waste management activities. Until 1996, Montana law provides for a 25% tax credit on the purchase of equipment used for recycling. The SWM Program should help publicize the law and support legislation which expands, or otherwise increases the effectiveness of the law.

**6. Provide increased technical assistance to institutional and commercial establishments.**

Implementing recycling and composting programs for the commercial sector can be more cost-effective because businesses and institutions have larger and more segregated waste streams. They offer considerable opportunity for waste reduction. Waste managers should encourage businesses to implement reduction measures by setting up model programs and sharing information on the cost savings realized; increasing information flow between commercial establishments and institutions; organizing waste exchanges; and encouraging worker education and purchasing guidelines focused on waste reduction.

**7. Increase government participation in integrated waste management activities.**

Government should serve as a role model for implementing waste reduction activities. The Integrated Waste Management Act requires state government agencies and universities to implement waste reduction measures. Other government entities including schools, agencies, courts, and the legislature should implement waste reduction plans and lead the way with purchasing and operational practices which increase source reduction, reuse, recycling, and composting. The SWM Program and many other state agencies have established in-house waste reduction and recycling committees to recommend changes in office waste disposal and product procurement standards. The SWM Program should expand its assistance to other state agencies in this regard.

## STRATEGIES FOR CONSIDERATION

**1. Shift program resources to the top methods of the integrated waste management hierarchy.**

The SWM Program is mandated to perform primarily regulatory, rather than educational, activities. Approximately eight of the nine technical staff of the SWM Program work at the lowest priority identified in the integrated waste management hierarchy--regulating and licensing landfills and incinerators. In some ways, this makes sense because most of the waste management activity in Montana occurs at the bottom level of the hierarchy, and these activities have the greatest potential for environmental damage if not done properly. However, the integrated waste management policy calls for increased emphasis in source reduction, reuse, recycling, and composting. As positions open in the SWM Program, several jobs should be redefined with these goals in mind and should be filled with persons skilled at implementing these programs.

Some members of the Solid Waste Plan Advisory Committee (SWPAC) argue that the SWM Program should not de-emphasize the regulatory program until all municipal solid waste landfills (MSWLFs) are lined, monitored, and properly regulated. Regulating landfills for the greatest environmental protection may be the best incentive for encouraging waste reduction and recycling. Then the true costs of disposal will be evident, more opportunities will open up, and educational efforts toward integrated waste management will not be wasted.

**2. Implement unit pricing or a variable rate disposal fee.**

Waste managers should encourage integrated waste management by providing consumers with an economic incentive to create less waste. Most Montana residents' garbage is removed once a week with revenues coming from a portion of their property tax, or from fixed bills for unlimited pick-up. These methods do not give residents any incentive to reduce their waste. With garbage rates based on volume or weight (often called unit-pricing or variable-rate pricing), residents are charged for the amount of garbage they produce. If they know they will pay more to produce more trash, residents will have an incentive to reduce, reuse, recycle, and compost.

Waste decision-makers should consider unit pricing carefully, to make sure the rate will guarantee a minimum revenue to support waste management services. Unit-pricing must be accompanied with a strong public education program and readily available alternatives to disposal. The public must have information and convenient options if the new rate structure is to work.

Some Solid Waste Plan Advisory Committee (SWPAC) members are concerned by certain aspects of unit-pricing. They point out that volume-based rates can encourage customers to buy containers which are too small to handle peak times in the natural fluctuation of the waste stream, can be difficult and expensive to collect, and can minimize health concerns in favor of recycling. Customers may try to avoid paying more by dumping their garbage illegally in rural areas, commercial dumpsters, or other customers' containers. Communities may need to impose more restrictive ordinances and stiffer penalties for illegal dumping, and step up enforcement.

**3. Implement full-cost accounting and reporting to ratepayers.**

Local waste managers should set garbage disposal fees based on a full-cost accounting method. This method includes all costs associated with a landfill from siting through post-closure. It differs from the common current practice in which fees are largely based on operating costs only. This practice artificially lowers the price paid by ratepayers for waste disposal, and slows movement toward integrated waste management systems.



Costs associated with new regulations for siting, engineering, construction, closure, and post-closure, are the fastest growing areas of cost and are often paid out of general tax revenues. Full-cost accounting means that local waste managers will need to update the costs of the landfill annually. Current costs and the anticipated costs of upgrading to meet new regulations are factored in and absorbed immediately by the ratepayer.

The move toward full-cost accounting allows for better long-term planning and cost control. Landfill space will be viewed as an asset to be used more wisely. To be fully useful to ratepayers, local officials should itemize waste management costs separately on tax bills. The SWM Program officials should be fully informed about the full-cost accounting methods and encourage local waste managers to consider implementing them.

The full-cost accounting method is not without problems. It requires local governments or private landfill operators to estimate future costs and set up reserves. Ratepayers may become disturbed by changing disposal fees and angry if reserves fail to meet future costs. This frustration may lead to increased illegal dumping.

#### Endnotes

13 EPA. *The Solid Waste Dilemma - An Agenda for Action*, Office of Solid Waste, Washington, DC, January 1989, p 16

14 Section 75-10-803, MCA

15 Section 75-10-104(9), MCA

16 Environmental Quality Council, *SJR 19 Interim Study of Solid Waste Management*, Report to the 52nd Legislature, Helena, MT, January, 1991



## CHAPTER 6. SOURCE REDUCTION

- Policy:** The State of Montana will promote source reduction as the most important method of solid waste management.
- Goal:** Every Montana community will have a source reduction program: everyone will participate in a source reduction program with waste generation rates per capita decreasing annually.

### WHAT IS SOURCE REDUCTION AND WHY THIS GOAL?

"Municipal solid waste source reduction is the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they enter the municipal solid waste stream."<sup>17</sup> This simple concept has major implications. Source reduction requires manufacturers to change how goods are produced, packaged, and sold. It requires consumers to change their attitudes, habits, and behaviors concerning how and what they buy.

Stopping waste before it starts is the first and most important way to reduce the amount of waste being disposed of in Montana. Managing wastes after they have been generated (through reuse, recycling, composting, and disposal) is important, but it is cheaper and more protective of the environment to reduce wastes in the first place than to try to cope with the management problems they create. It is critical that the State of Montana does everything possible to encourage source reduction as the first method of waste management. Some general methods of source reduction are discussed briefly below.

**Decreasing consumption.** Many consumers generate more waste than necessary. They can decrease waste by choosing to buy fewer, more durable items, by considering more carefully what they need, and by being willing to use products which may not be the latest fashion or model. Manufacturers may plan for their products to become obsolete and then spend large sums of money on advertising to encourage consumption. By changing these consumptive patterns, waste can be reduced.

**Increasing product durability.** By the year 2000, it is estimated that over 60% of our waste will be material that has had a useful life of less than three years.<sup>18</sup> Many products, such as disposable diapers, razors, pens, and eating utensils, are made to be used only once. Other products are manufactured cheaply with poor materials or workmanship. They are often designed in such a way that they cannot be easily repaired. It becomes more cost-effective for consumers to buy a cheap replacement than to fix the old one. Building things to last longer reduces waste.

**Reducing packaging.** Packaging has an important role in our society. It can help to keep food fresh, protect products, prevent shoplifting and tampering, give instructions and product information, and make purchasing more convenient. However, packaging accounts for approximately one third of the waste we throw away.<sup>19</sup> Many times the packaging is not necessary. Consumers should make more careful choices when they shop, avoiding products that are overly packaged and buying products from bulk supplies using their own containers. Manufacturers should consider waste generation and source reduction when they determine how a product is packaged and sold. They should also consider the potential to "lightweight" products or packaging, that is, to use fewer resources over the total life-cycle from raw materials to production to disposal.

**Manufacturing and using less toxic products.** Because the toxic portion of our waste stream creates the most serious water quality problems associated with landfills, decreasing the toxicity of our waste is an important part of source reduction. Many common home and shop products, in addition to industrial and commercial waste, contain toxic constituents. Consumers should choose to buy less toxic alternatives. Retailers should stock and promote them. Shelf labeling can educate consumers on toxic products and alternatives. Manufacturers should produce and market less toxic alternatives. Household hazardous waste is discussed in more detail in Chapter 12.

### Environmental Issues

Changing management methods for waste after it has been created is often a matter of transferring pollutants from one medium to another. Source reduction eliminates this concern because it works at the front end of the waste stream by reducing waste generation. One of the reasons source reduction is Montana's first waste management priority is because it alleviates environmental problems associated with disposal. A smaller waste stream means less landfill leachate, ash disposal, transportation and fewer landfills, incinerators, and recycling processes. All these may have associated environmental impacts.

Decreasing consumption and buying more durable goods reduces the manufacturing pressure and the resulting environmental impacts associated with resource extraction, energy consumption, transportation, and manufacturing. A savings is realized by using resources more efficiently.

Decision-makers should always consider potential environmental impacts before implementing any waste management method, including source reduction. If a change in production processes increases the net amount or toxicity of wastes produced during the entire life of a product, source reduction is not occurring.<sup>20</sup>

### Economic Issues

Implementing source reduction educational programs may be the least costly of the waste management methods. Public education must be adequately funded, but generally costs less than siting new facilities. Source reduction activities save disposal costs. A smaller waste stream means less waste to transport and manage. If taxes or bans on particular products or packaging are implemented, they will have economic impacts for consumers. If product or packaging design standards are mandated, there will be new costs for manufacturers which they will pass along to consumers.

### Barriers to Source Reduction

1. Social and cultural values favor convenience, lower costs, time savings, and newness in consumer products. We live in a consumption-driven economy.
2. Consumers do not generally think about source reduction and often confuse it with recycling. There is a general lack of understanding about what consumers can do to prevent waste at its source. People do not know how to recognize products that have less packaging, use fewer resources, or are less toxic.
3. Source reduction alternatives are often not available to consumers. It can be difficult to find products which are less toxic, environmentally preferred, concentrated, or available from bulk sources.
4. Few economic incentives exist for consumers to practice source reduction. Source reduction already occurs in industry when the technology develops and economic forces make it profitable.<sup>21</sup>
5. Source reduction is hard to measure. This makes public and government support and funding difficult to obtain.
6. Source reduction is difficult for government to mandate. Montana is a small market and has little influence in dictating packaging and product standards. Montana has very few in-state manufacturers.

RECOMMENDATIONS<sup>22</sup>

**1. Implement education, recognition, and voluntary programs.**

Education, recognition, and voluntary programs may be the most cost-effective source reduction strategies for Montana. These programs are discussed briefly in Chapter 5, recommendation 1 (see, pp. 45 and 45). In addition they may include in-store shopper awareness programs, labeling of environmentally-preferred products, product and packaging audits, and letter writing campaigns to influence manufacturers or governing bodies. Local policy-makers should implement educational programs through media campaigns, printed materials, workshops, and other technical assistance.

The Solid Waste Management (SWM) Program should research source reduction programs and evaluate their potential effectiveness for Montana communities and the state as a whole. The SWM Program should set up pilot projects and case studies in several small communities. A listing of resources and programs, and an assessment of each, should be made available to communities and used to update this plan.

**2. Provide economic incentives for source reduction.**

Economic incentives for source reduction, such as variable rate disposal fees for consumers (see, p. 49) and tax credits for businesses, will increase the impact of voluntary educational programs. The SWM Program should use the annual renewal application process to encourage local solid waste officials to implement source reduction programs by giving discounts on disposal fees to communities which implement approved source reduction programs. State government should fund a grants program for local source reduction programs.

**3. Join with major western markets to demand high quality products and packaging standards.**

Changes in packaging and product durability and design are major source reduction issues which are difficult for Montana to influence because of its small market share. It is important for SWM Program officials to participate in regional efforts<sup>23</sup> to exert such influence, and to monitor other western states' legislation to determine whether Montana can "piggy-back" on their efforts.



## STRATEGY FOR CONSIDERATION

### **1. Enact taxes or fees on certain items or materials.**

Policy-makers can consider imposing taxes or fees on items or materials which are either hard-to-dispose-of or which have costly environmental impacts. Toxic chemicals, auto batteries, used motor oil, pesticides, white goods (used appliances), and tires are examples. A tax on disposable products or toxic cleaning compounds could discourage use and fund source reduction programs. Some states are considering taxes on products judged to have excess packaging. Mechanisms for charging at the point of sale would need to be implemented state-wide. However, disposal fees on hard-to-dispose-of items could be implemented at the local level and used to fund source reduction programs.

Taxes and fees require additional bureaucratic systems, are difficult to establish in a fair manner and place an additional burden on consumers. Often those who can least afford it, end up paying a greater share of their income in taxes. Some solid waste experts believe taxes and fees will not reduce waste because desirable alternatives are not available, and because taxation will not address the barriers to waste reduction. They believe taxes should be used only as a last resort, when the need has been clearly demonstrated.

## Endnotes

17. The World Wildlife Fund and The Conservation Foundation, *Getting at the Source: Strategies for Reducing Municipal Solid Waste*, Final Report of the Strategies for Source Reduction Steering Committee, White Plains, NY, 1991

18. Ibid.

19. Ibid.

20. Life-cycle assessments can help us understand the costs associated with use of disposable products compared to reusing more durable ones. For example, washing reusable diapers or dishes has impacts on water quality and energy consumption. Life cycle assessments can help us compare the environmental costs of manufacturing, treating and reusing the durable product to manufacturing and disposing of the disposable products. The assessment considers the consumption of resources and energy and the production of waste from extraction, production, use and disposal. Currently, however, life-cycle analysis is a very inexact science. Thoughtful deliberation may be an appropriate way to evaluate source reduction measures.

21. In the packaging industry for example, each metal can uses just 25 percent of the amount of metal used 30 years ago, plastic bottles use about 50 percent of the plastic; and glass bottles 75 percent of the glass formerly used--all in response to economic forces. The World Wildlife Fund and The Conservation Foundation, *Getting at the Source: Strategies for Reducing Municipal Solid Waste*, Final Report of the Strategies for Source Reduction Steering Committee, White Plains, NY, 1991 p. 11.

22. Numerous source reduction strategies are outlined in detail in World Wildlife Fund and The Conservation Foundation, *Getting at the Source: Strategies for Reducing Municipal Solid Waste*, Final Report of the Strategies for Source Reduction Steering Committee, White Plains, NY, 1991. An effort was made here to discuss strategies which lend themselves to state or local implementation in Montana.

23. See, Appendix E for current regional efforts.



## CHAPTER 7. REUSE

- Policy:** The State of Montana will promote reuse of products and materials that would otherwise become part of the waste stream. Reuse is preferred over recycling, landfilling and incineration as a solid waste management method.
- Goal:** Every community will have an active reuse program; everyone will participate in reuse programs with the per capita waste generation rates decreasing annually.

### WHAT IS REUSE AND WHY THIS GOAL?

Many products which have performed the function for which they were designed, still have value in their present form either for the same purpose or some other purpose. Containers can be refilled. Furniture and appliances can be repaired. Construction and demolition wastes can be used for small remodeling or construction projects. Clothing can be mended or donated to service organizations.

Products which have outlived their useful life for one consumer may still have value for someone else. Consumers who want the newest model or the latest design, may overlook this potential value and discard usable products and materials. Many discarded items could be repaired.

The goal of reusing products is to keep them out of the waste stream. They are not waste until thrown away. With adequate community support, many Montana communities can significantly reduce their waste through reuse programs.

### Environmental Issues

Reuse relieves environmental problems associated with disposal. A smaller waste stream means less landfill leachate, less ash disposal, less transportation and fewer landfills, incinerators, and recycling processes. All these have associated environmental impacts. Reuse is a higher waste management priority than recycling because products do not have to be remanufactured. Markets for reused items are generally local, eliminating transportation barriers. Reusing goods reduces the manufacturing pressure and the resulting environmental impacts associated with resource extraction, energy consumption, transportation and pollution.

In the past, reuse has often involved salvaging in landfills. The health and safety risks inherent in salvaging on the working face of a landfill are substantial. It is more appropriate for the diversion to occur at the source and for items to be resold at yard sales or thrift stores. The diversion may also take place at a controlled site such as a transfer station, container site, or a materials recovery facility (MRF).

#### Economic Issues

Public education, one important strategy for implementing reuse programs, requires a financial investment, but has a cheaper price tag than building new facilities. There would be costs to diverting usable items from the waste stream at a transfer station or MRF, and costs to operating a reuse and repair center. However, these costs could be minimized by asking the public to separate reusables, and by using volunteers, non-profit groups, existing facilities, and non-monetary contracts. Local officials should not overlook the possibilities of putting people to work repairing rather than manufacturing.

#### Barriers to Reuse

1. Manufacturers may design products to become obsolete and to be more expensive to repair than replace. These issues must be addressed at the national level.
2. One common public perception is that used items are of little value and that it is not proper to use what others have discarded.
3. There are barriers to salvaging at waste facilities involving liability and public health and safety issues. Reuse areas can become unsightly if not well organized. County ordinances against community decay might deter these sites.
4. Reuse programs take time, money, and energy to organize and maintain.
5. Retailers and manufacturers of new goods may resent the competition if numerous reused products are being marketed.

### RECOMMENDATIONS

#### **1. Implement education, recognition, and voluntary programs.**

Reuse programs provide a good way to get a community involved in solid waste issues. Reuse and repair are common sense solutions to waste reduction and can capture community spirit and use many types of volunteers.



Many of the strategies included in the discussion in Chapter 5, recommendation 1, (see, pp. 45 and 46, should be evaluated for reuse and will not be repeated here. In addition, people will need to be educated to change biases against old/used items. They need to learn about the opportunities for reuse. Local officials and residents will need to accept and plan for diversion of usable items from the waste stream. Some people will need training in basic maintenance and repair services.

Local reuse measures will encompass a range of activities from swap programs for durable goods, such as home furnishings and clothes, to collection events for paint, and bulletin board lists of wastes wanted to buy and to sell. Local governments will not acquire the regulatory status of hazardous waste generator from wastes taken in through household hazardous waste (HHW) collection programs, regardless of the amount accumulated, if, the materials are from 1) household sources and 2) businesses that are conditionally exempt, providing the waste is disposed legally. This waste is often the same as wastes from industrial and commercial sources, but is exempt because its origin is from households and small producers that generate under certain quantities. (See, Chapter 12.) However, communities or groups sponsoring or organizing the HHW event are responsible for proper documentation of incoming wastes and proper storage, treatment, and disposal of the collected material. As a precautionary measure, community officials should establish procedures for reviewing and registering community reuse activities. The SWM program has prepared a guidebook on HHW conducting collection events.

Within its mandate to serve as an informational clearinghouse for integrated waste management, the SWM Program should collect and evaluate materials on reuse programs. It should work with local waste managers and groups interested in solid waste issues to provide education and information to communities.

## **2. Establish community reuse areas and repair centers.**

Many reusable and repairable products and materials, such as home furnishings, appliances, clothing, and construction wastes are thrown away. Communities can divert these items from the waste stream and store them in designated reuse areas to be sold or given away to the public or to thrift store owners. Communities can offer call-in, pick-up service for reusable items. Waste managers can ask consumers to place reusable items in the designated area and allow them to pick up other items they may need. The solid waste facility may use its own employees for sorting, or contract with someone either for money or a share of the salvaged goods. Goods from this area could be available for distribution in emergencies, such as floods or fires.

A repair center associated with the reuse area would allow items to be fixed and sold. Such a center could create jobs, provide meaningful volunteer work for senior citizens or other special populations, or be a project for a non-profit group.

Reuse opportunities at unattended sites, such as container sites, will present special challenges. Waste managers could encourage consumers to set reusable items in a designated area. Local officials may be able to enter into a non-monetary "contract" with someone to keep the area neat in exchange for the salvage, or use public offenders sentenced to community service. Reuse and repair centers can be shielded from view in a manner similar to junk vehicle yards. Using existing facilities and working with existing businesses will help cut down on costs for these programs.

The SWM Program should encourage solid waste facilities to consider reuse programs that are operated in a safe and proper manner. Program officials can discuss the possibilities with waste managers, make the approval process simple, and emphasize that diverting waste saves landfill space and lowers fees.

### **3. Expand swap programs, yard sales, and thrift stores.**

Community swap programs allow consumers to bring unwanted products to a central place and pick up products that they need. Such exchanges require community organization and are often limited to single categories such as paint, but could be expanded to include other materials.

Local waste managers should actively promote yard sales, which happen informally in many communities. At yard sales, consumers invite the public to buy unwanted items they have placed in their yard, often for a low price. Communities could organize a centralized yard sale or flea market. Communities could also help promote collections for thrift stores or non-profit groups who provide goods to low income people. The SWM Program should promote reuse program ideas through the informational programming mentioned in Recommendation #1. SWM Program staff have prepared a handbook that includes guidelines on organizing and operating a household hazardous waste collection program and guidelines for registering the event with the state.

### **4. Promote waste exchanges.**

Waste exchanges do not need to involve a central location; they can occur through newspapers, publications of civic organizations, community bulletin boards, and computer networks. Information about people who have useable products they do not want, and people who need products they do not have, should be listed and made available to the public. The two parties negotiate the exchange on their own.

The Montana Chamber of Commerce operates an industrial waste exchange with a grant from the Montana Department of Health and Environmental Sciences (MDHES). While many of the listed wastes may be on-going waste streams from businesses, many such programs are open to one-time listings from the general public. Communities could start a local waste

exchange for all kinds of unwanted items. MDHES should continue its support of the industrial waste exchange, review its operation, and recommend changes to increase its effectiveness.

**5. Provide economic incentives for reuse.**

Policy-makers should consider the economic incentives and disincentives recommended in Chapters 5 and 6 for their impact on reuse as well as source reduction. In addition, tax credits should be given to businesses specializing in repair, restoration, or remanufacture of products; or to businesses participating in efforts to standardize products to facilitate repairability and interchangeability of parts. Policy-makers should provide tax rebates or subsidies to consumers or manufacturers of reusable or repairable products. Greater tax incentives could also be given for donating used goods to charitable organizations. The SWM Program should support legislation in this regard.

**6. Evaluate laws and regulations which may impede reuse.**

Department regulations state in ARM 16.14.520(6) that "Salvaging of materials at all sites is expressly prohibited unless the licensee demonstrates to the department's satisfaction that it can be done properly" (emphasis added). This is not a blanket prohibition, although it has often been interpreted as such. In light of the importance of reuse in the integrated waste management hierarchy, the SWM Program will carefully review any plans submitted for controlled salvaging operations at appropriate waste facilities.

STRATEGY FOR CONSIDERATION

**1. Increase the use of reusable packaging and explore the issues and feasibility of increasing the use of refillable containers.**

Refilling containers of products such as beverages, motor oil, pesticides, household cleaning products, bulk foods, or personal care products is one important method of reuse. A refillable container used six times eliminates the need to manufacture five other containers. This not only reduces the waste stream, but can conserve resources, reduce pollution, and save energy. On the other hand, the use of refillables can increase transportation costs, fuel consumption, and water usage. The complete range of environmental impacts are complex and have not yet been fully evaluated.

Whereas refillable containers were once commonplace, they have all but disappeared from the marketplace. Public education to increase consumer demand for refillable containers may encourage manufacturers to meet that demand. Individual consumers can reuse containers and



packaging for storage purposes, by shopping for bulk foods, and in a variety of other creative ways. A deposit system, reuse tax, or voluntary industry initiatives may also increase the use of refillables.

Some European countries allow consumers to return packaging to the retail store and require distributors to take products or packaging back to manufacturers. With such a system, reuse of these materials becomes more feasible. However, such a program instituted in Germany presently has logistical, financial, and material surplus problems due to the accelerated phase-in of high recovery rates which have outpaced markets and end uses.

A considerable difference of opinion exists about the effectiveness of deposit laws, their impact on reuse and recycling, and the appropriateness of refillable beverage containers. Nine states have enacted laws requiring a deposit on beverage containers; none of those states have repealed their law. However, numerous other states, including Montana, have considered and rejected deposit legislation.

Proponents of deposit laws point out that deposits help to ensure that beverage containers are returned to the distributor, allowing refillable beverage containers to compete with the more convenient one-way beverage containers. Because packaging represents about one third of the waste stream, they argue, mechanisms which promote refillable packaging are important to achieving maximum waste reduction.

Opponents to deposit laws point out that deposits, by themselves, do not guarantee that beverage containers will be refilled, only that they will be returned. They maintain that such deposit legislation amounts to a tax on the beverage industry. They cite that 65% of the aluminum beverage containers in Montana are being recycled and that EPA data shows that beer and soft drink containers are only 2.3 % of municipal solid waste by volume. They caution that in states like Montana, long hauling distances, low population economics, and limited availability of refillable beverage containers would make a deposit system ineffective and expensive. They also point out that consumers consistently choose the convenience of one-use beverage containers, even when refillables are available and cheaper.

The SWM Program should work with other educational organizations to collect data and provide information to the public about various issues concerning refillable containers and reusable packaging. The program should open discussion with the distributors of motor oil, pesticides and other non-beverage products, to gradually increase the use of refillable containers.



## CHAPTER 8. RECYCLING

**Policy:** The State of Montana will promote the steady increase in the amounts and types of materials recycled by promoting collection, processing, remanufacture, and purchasing of recycled goods. Recycling is preferred over landfilling and incineration as a solid waste disposal method for all recyclable materials.

**Goals:** Every community will have an active recycling program; everyone will recycle all solid waste that can be practically recycled with per capita waste generation rates decreasing annually.

Markets for all recyclables will be established and reliable; recycled and recyclable materials will be purchased and used when available.

### WHAT IS RECYCLING AND WHY THESE GOALS?



When the useful life of a product is over and no way has been found to reuse it in its original form, waste managers should explore composting or recycling as the next option. Composting is the recycling of organic matter and will be discussed in the next chapter. Recycling is a higher priority than landfilling and incineration because it helps conserve valuable resources and energy. At every stage in the production of a product from virgin materials, energy and resources are consumed. Recycling aluminum, for example, saves 70-95% of the energy involved in production of aluminum from ore.

Recycling requires changes in behavior and habits of consumers, retailers, and manufacturers. When buying a product, consumers need to consider whether it is made from recycled material, and whether they can recycle it in their community. They must separate it from wastes destined for disposal. Full, community-wide recycling requires retailers and other businesses to purchase recycled products for their own use and for resale, and to collect their own wastes for recycling. Manufacturers would need to make an investment in the equipment and processes needed to use post-consumer materials in manufacturing their products.

Recycling is all activities involving the collection, storage, sorting, shredding, shearing, baling, and chipping of recyclable material, including but not limited to glass, paper, plastic, metal or textiles; the processing of recyclables to prepare them for resale; the marketing of recovered material for use in the manufacture of similar or different products; and the purchase of products containing recycled material.

The major steps involve the collection of materials from consumers, the processing and transportation of those materials, the conversion of those materials into useful products through remanufacturing, and the purchase and use of those new products. It is important to find a balance of each of these parts of the equation. If any step is missing, recycling is not occurring. The major steps in recycling are discussed briefly below.

### 1. Collection

Waste managers and recyclers should make collection of recyclable materials as easy and convenient for consumers as waste disposal. Collection programs should encourage consumers to separate recyclables from other waste. This "source-separation," ensures a product of higher quality and greater value. Some collection program options are outlined below:

**Drop-off centers** may be the only cost-effective collection systems for rural areas. Separate bins for source-separated materials are placed at convenient locations for consumers to drop off their recyclables.

**Buy-back centers** also depend on consumers to bring in their recyclables, some of which are paid for at the going rate.

**Community collection events** require a great deal of volunteer effort and careful planning, but can be effective. Residents are asked to store their recyclables until the day of the event, when they can bring them to a central location. These efforts are usually done in coordination with the local buy-back center.

**Commercial collection programs** target the large commercial sources of recyclables with a collection program. Greater volumes of segregated recyclables may be collected in this manner compared to residential collection.

**Curbside collection** of residential and commercial recyclables gives communities the highest participation rate of any collection program, due to increased convenience. It also costs the most to operate.

**A hybrid** of several of these options may be best for some communities.

Most commonly in Montana, private recycling companies operate buy-back centers and work with communities which may have a variety of other collection mechanisms. In some communities, non-profit groups, or local recyclers operate drop-off bins. Some communities

may sponsor occasional high-visibility collection drives. Very few curbside collection programs exist. Waste managers trying to increase recycling should build on existing systems and mechanisms.

Surveys which have been conducted in Montana communities show that citizens want to recycle.<sup>24</sup> Many are willing to pay to recycle. Many more would recycle if collection were made convenient and inexpensive. Lack of recycling is caused by long distances to market, low volumes, and a lack of resources. It is not caused by lack of commitment by Montana consumers.

## 2. Processing and Transportation

Once materials are collected from consumers, they must be prepared for market. This may involve additional separation to improve the quality, baling or compaction to improve transportation efficiency, storage until sufficient quantities are on hand, aggressive marketing, and finally, transportation to markets. Transporting post-consumer materials long distances will be profitable only when the remanufacturer is willing to pay a high enough price to the recycling processor.

In Montana, processing and transportation have primarily been accomplished by private recyclers. As recycling begins to assume a greater role in waste management planning, opportunities for public-private partnerships will increase.

## 3. Remanufacture

The success of materials collection and processing depends on the availability of markets. Remanufacturers who want to purchase post-consumer materials and convert them into new products, must be located in the economic region. In Montana, demand-side or market development strategies are more likely to be effective than supply-side or collection strategies, because of the lack of markets for recyclable goods.

Remanufacturers are concerned about the net cost of the post-consumer materials, and the existence and location of the end-user markets. They must be able to buy the supply at a price low enough, and sell the product at a price high enough, to make a profit after all their expenses. Remanufacturers want assurance of long-term commitments by the supplier of the post-consumer material and by the end-user to purchase the recycled product. In other words, they need to be confident of supply and demand. With such assurances, the remanufacturer can justify the capital investment needed to buy new equipment or revamp processes for using more post-consumer materials.



Across the nation, the supply is available. Consumers continue to throw things away and most of them are willing to separate recyclables from their waste. Public education programs have convinced more consumers to separate. Collection programs have been successful in getting high participation rates, especially when collection is convenient and does not add additional costs for the consumers.

#### 4. Purchasing

The demand side of recycling has been more problematic nation-wide. When demand for recycled products is low, remanufacturers cannot sell them, which means they have less need for the post-consumer materials supply. That means the collected material is either stockpiled or disposed of in landfills or incinerators. The demand might be low for a number of reasons. Consumers may not be aware of the availability of recycled products, the quality of the product might not meet consumer preferences, or it might cost more than a similar product made of new materials. A vital recycling strategy is to educate end-users to the availability and quality of recycled products. For recycling to work, consumers must purchase remanufactured products.

A great deal of discussion has been occurring nationally about what it means to say a product is "recycled". This debate is about whether manufacturers can claim that the use of "pre-consumer" scrap that is produced during the manufacture of an end product is part of the "recycled" content of a product. In the absence of a national definition, "recycling," for the purpose of this plan, refers to processes using "post-consumer" waste which has been discarded by consumers after having fulfilled its intended purpose, and is typically thrown away and hauled to landfills.

#### Environmental Issues

Recycling offers environmental benefits similar to source reduction and reuse. It extends the life of landfills, saves natural resources, and generally requires less energy than producing products from virgin materials. By decreasing the waste stream, we lessen the environmental problems associated with landfilling and incineration.

Recycling also has some potential risks to human health and the environment. These are associated with the generation of heavy metals and organic chemicals in the remanufacturing processes. The same or greater risks are associated with the manufacture of virgin products, however. Little research has been done comparing the types and amounts of pollutants generated in manufacturing processes for recycled materials versus those for new materials over the life cycle of a given product. Waste decision-makers should be aware that source reduction, reuse, and composting provide greater environmental benefits than recycling.



### Economic Issues

Recycling can create new industry for Montana, provide for new local market development, and create jobs. The three primary recyclers in Montana account for more than 280 jobs. It is unlikely that any new jobs would be created if these resources were sent to the landfill instead of the recyclers. Some studies indicate that recycling creates six times as many jobs as landfilling.<sup>25</sup>

The implementation and operation of recycling programs, however, can be a large expense to communities. Analysis of cost-effectiveness of alternative options is an important factor in considering a recycling program. Decision-makers must consider capital costs, operating costs, and external costs. Operators can realize revenues from the sale of recyclables, but due to market instability, revenues cannot be depended on to offset many operational costs. Recycling markets will likely strengthen in the future, as buyers take advantage of the increased supply of recycled products, generating more revenue that will help offset the costs of implementing recycling programs.

Local governments and citizens alike must recognize that recycling will cost money and must be paid for as a public benefit like police protection, water treatment, and garbage collection and disposal. Placing an emphasis on public education to increase use of existing recycling mechanisms rather than building new facilities may also be cost effective. Implementation of new public recycling programs should be coordinated with existing private sector recycling operations. Private operations contribute to tax revenues and increase recycling in the community. Local officials should consider the survival of these existing private recycling efforts when implementing new programs that take away their market share.

All recycling options incur collection costs. However, curbside collection of source-separated recyclables is significantly higher than for mixed waste. The difference can be lessened by using the same collection vehicles on the same routes to collect mixed waste and recyclables on an alternating schedule. Drop-off bins, buy-back centers, and collection events are much cheaper for local governments because residents do their own hauling. Studies on the costs of recycling vary widely depending on the location and type of program. Decision-makers can only determine the true costs by examining the unique factors at their specific site.<sup>26</sup>

### Barriers to Recycling

1. Markets for recyclable materials are historically unreliable due to fluctuating supply and quality.
2. Because of Montana's low population, the volume of recyclables is low. Recyclers must find storage space to accumulate large enough volumes to make transportation cost-effective.

3. Long distances to markets and high costs of transportation make recycling difficult for many commodities in Montana.
4. Many communities lack financial resources to purchase balers, conveyors, trucks, and other equipment, technology, or facilities that are essential to recycling and marketing collected goods.
5. The lack of uniformity in terms, definitions, and standards makes it difficult for Montana, as a small market, to make demands for recycled content in its purchasing.
6. Landfilling is still relatively inexpensive in Montana. Low garbage disposal fees are a disincentive to recycling. Consumers are generally unaware of the full costs of waste management.

## RECOMMENDATIONS

### **1. Increase educational programs.**

Recycling provides an excellent opportunity for public involvement in solid waste decisions. Many people want to recycle and will be a source of creative energy for communities who implement recycling programs. An aggressive public education program can change people's perception of used materials as waste, to used materials as resources. It can promote source separation which will assure better markets and a higher quality product.

An education campaign for recycling is extremely important to increase participation, to implement new services, and to provide individuals with more understanding of the market forces in Montana. Recycling education also needs to emphasize that recycling is not just the collection of products, but includes the commitment to purchase and use products made of post-consumer material, and products which can be recycled.

Local governments, community organizations, or commercial businesses should conduct public education campaigns to encourage consumers, offices, and institutions to buy recycled products. Informed consumers will ask retailers for recycled and recyclable products, who will in turn ask their suppliers, who will ask the remanufacturers. This will help drive recycling markets and close the recycling loop. Other education ideas are presented in Chapter 5, recommendation 1, pages 45 and 45.

The Solid Waste Management (SWM) Program should increase its educational resources under its mandate to serve as a clearinghouse for integrated waste management issues. It should devote a minimum of one employee to be a resource for communities on recycling and other waste reduction issues.

**2. Increase purchasing of recycled products and materials.**

State government, as one of the largest buying units in the state, has set a goal of purchasing as many recycled products and materials as possible.<sup>27</sup> The Montana Legislature should continually monitor and strengthen mechanisms for reaching these goals. State law should hold local governments and school districts to a similar goal.

The State should also offer incentives for Montana businesses to use recycled materials. There is currently a 5% tax deduction for the use of recycled material in businesses. This incentive, which is set to terminate at the end of 1995, could be strengthened or lengthened. All businesses, industries, and institutions should voluntarily establish procurement guidelines which favor recycled materials. The state should also offer a publicity incentive such as a "green seal" of approval for businesses which purchase recycled materials.

Montana should join with other western states to set minimum content standards requiring or encouraging the use of a certain percentage of recycled content in products such as newspapers. Other incentives could be offered to retailers to encourage them to stock and advertise recycled products.

The SWM Program should continue the Market Development Task Force to monitor government procurement of recycled products. It should request funding for a "green seal" program and increase participation in regional recycling efforts.

**3. Expand drop-off centers, community collection events, and commercial collection.**

Drop-off boxes and community collection events in cooperation with the nearest buy-back center can be relatively low cost methods of collection, given the current barriers to recycling. They will not, however, have as high a participation rate as curbside collection, because they are not as convenient for consumers. The state parks program should offer drop-off centers for tourist traffic. Commercial collection programs can be effective at removing large quantities from the waste stream because the waste is more concentrated and homogenous. When markets are more developed, recyclers should expand collection efforts to include residential areas. Small communities can overcome their lack of equipment, technology, and facilities, by working closely with the nearest buy-back center.

The SWM Program should increase its level of assistance to communities in setting up drop-off systems, community collection events, and commercial collection systems by providing information through its clearinghouse function, providing economic incentives (see, recommendation #5 below), and establishing a small grant program (see, recommendation #6 below).



**4. Concentrate state-wide recycling efforts on one or two products.**

Concentrating our recycling efforts on a few products will afford more chance of success. Efforts for the widespread collection of recyclable commodities should focus on materials that have strong markets. At the same time, the SWM program will explore ways to foster local end uses and investigate solutions for strengthening the markets for commodities that constitute a large amount of the waste stream.

Currently, an in-state market exists for old corrugated cardboard. Also, telephone companies have sponsored collection programs for phone books in several Montana cities. State and local governments should work with the private sector to establish mechanisms to ensure that maximum recycling is accomplished for specific commodities state-wide. With these mechanisms established, other commodities may be more easily added to the system when their markets strengthen.

The SWM Program should immediately identify one or two commodities for a recycling campaign and help coordinate a state-wide collection effort. The program would help maintain citizen enthusiasm at a time when they are frustrated over lack of recycling opportunities created by market forces.

**5. Provide economic incentives for recycling.**

Policy-makers should design disposal fee schedules to reward those who recycle. It may be possible to implement higher tipping fees for people who do not recycle, or a rebate for those who do. Garbage rates based on volume, accompanied by public education and collection or drop-off opportunities, can increase recycling. If consumers pay more to throw more away, they will have an incentive to recycle. Variable rates are discussed on page 49.

Currently, Montana has very few industries which use recovered post-consumer materials in manufacturing processes. The state should provide incentives to encourage the development of such businesses. These incentives can take the form of investment tax credits, research and development tax credits, or accelerated depreciation of recycling equipment and facilities.

Because of the low volume of recyclables and great distances to markets, policy-makers should emphasize development of local, small, low-technology businesses. Low-interest loans and technical assistance could be made available through local economic development corporations.

The SWM Program should provide information to communities on economic incentives for recycling. It should work with local groups to provide loans and technical assistance. It should support legislation to expand incentives.



**6. Provide grants or loan programs for local recycling efforts.**

Communities often need financial and technical assistance to overcome barriers and implement recycling programs in their communities. A relatively small amount of money could help purchase a needed piece of equipment, or embark on an educational campaign. Local governments or school districts that receive the grants could be required, when possible, to work with private enterprise in their proposed project. Current law provides for a grants program for local government solid waste projects, but it has never been funded. The SWM Program should explore funding mechanisms for existing grants and loan programs, develop grant guidelines, and consider expanding the eligible applicants to include non-profit organizations.

STRATEGIES FOR CONSIDERATION

**1. Build materials recovery facilities (MRFs).**

MRFs are recycling centers which can be designed to accept either mixed household garbage or source-separated recyclables. With a system of conveyors, mechanical sorters, and human labor, the recyclables are sorted into marketable commodities. Sorting and compaction help achieve a high quality product and more economic transportation to markets. MRFs that require some prior source separation do more to change habits and educate the public. MRFs can be designed to handle a variety of integrated waste management operations, such as reuse centers, composting areas, and transfer stations.

Building an MRF requires a capital investment that may not pay off if recycling markets are not available. Waste decision-makers will want to consider whether markets are available for the products to be collected, before building an MRF.

**2. Plan for long-term storage.**

Collection programs should be based on the existence of markets so materials can move fairly quickly from communities. However, the need to accumulate volume, and the possibility of temporary market disruptions, means recyclers must provide for storage. Communities should consider securing extra warehouse space, baling materials to make storage and transportation more efficient, or shredding excess or damaged paper and adding it to compost operations. It may also be possible to store source-separated glass, plastic, and metals in landfill monocells for later recovery.

Accumulations of some materials may attract disease vectors, invite trespassing, present litter problems, or become unsightly. The SWM Program should review regulations which makes storage problematic and recommend changes that ensure proper storage.

**3. Adopt laws requiring that all citizens have the opportunity to recycle.**<sup>28</sup>

An "opportunity to recycle" law should provide a menu of recycling options including many of those mentioned above or elsewhere in this document (e.g., expanded educational programs, expanded drop-off centers, variable garbage rates, yard debris collection and composting, commercial and institutional curbside collection, multi-family dwelling curbside collection, and residential curbside collection). The law would require communities to implement specific options or a specified number of options of their choice, depending on population.

Some Solid Waste Plan Advisory Committee (SWPAC) members believe that mandatory recycling laws of any kind will only result in stockpiles of materials, not recycling. They believe a free market approach, while it may take more time to develop, will be more successful in the long run. Until markets develop, mandates may hinder recycling efforts by raising public expectations beyond what is possible.

**4. Implement disposal bans.**

When products are banned by law from going to landfills or incinerators, recycling may increase. Bans are most effective when they are highly publicized and are phased in over a period of years. This gives the four steps in the recycling loop--collection, processing and transportation, remanufacture, and end-use markets--a chance to develop as each process prepares to accept the banned material. Bans will not be effective unless reuse, recycling, or composting mechanisms are in place.

If the date of the ban arrives and these mechanisms are not in place, some communities may experience flow control problems or large stockpiles. In the absence of convenient alternatives, some communities may choose to disregard the law. Implementation and enforcement of disposal bans carry additional costs.

Endnotes

24. Steve Carroll. *A Report on Missoulians' Attitudes on Source Separated Curbside Recycling and Other Solid Waste Issues*, MontPIRG, Missoula, MT, March 1992 and Vision 2000 Environmental Protection Committee, *Presentation to the City Commission*, Great Falls MT, March 1992.

25. Rockefeller Institute of Government, *New York Recycling Forum: Principles of recycling and recommendations for State Action*, New York, 1986.

26. Frank Miller, Jr., "Does it Cost More to Recycle?", *MSW Management*, September-October 1992.

27. Section 75-10-805, MCA.

28. See, Oregon's Recycling Opportunity Act, passed in the 1983 regular session (ORS 459.165-200).

## CHAPTER 9. COMPOSTING

- Policy:** The State of Montana will promote the steady increase in composting of organic materials. Composting is preferred over landfilling and incineration as a solid waste disposal method for organic materials.
- Goal:** Every community will have a municipal or backyard composting program for organic materials; everyone will participate in composting programs with per capita waste generation rates decreasing annually.

### WHAT IS COMPOSTING AND WHY THIS GOAL?

"Composting" means the controlled biological decomposition of organic matter into humus. The same process occurs continuously in nature when organic matter is exposed to air and moisture. Waste managers can accelerate the process by controlling the mix of air, water, temperature, and nutrients.



Yard wastes and food wastes are the materials most commonly composted. Montana also generates large amounts of feedlot and log yard wastes which can be composted. These four wastes (yard, food, feedlot, and wood wastes) are collectively called "green waste." Old paper, treated sewage sludge, and other household organics are also candidates for composting.

Composting can reduce the amount of waste going to landfills or incinerators. Nation-wide, yard wastes comprise about 18% of the waste stream by weight, food wastes about 7%, and paper about 41%.<sup>29</sup> The exact percentages of these components in the Montana waste stream are unknown. By co-composting two or more waste streams, a community might divert 25-50% of its waste. Even if the resulting compost was simply landfilled, the process would have reduced the volume of these wastes by 50-85%.<sup>30</sup>

Composting can provide a useful product. The quality of the final compost will help determine the possible markets. A high quality compost can be used as an amendment for marginal soils or a top dressing on lawns and golf courses. Nurseries, schools, farmers, landscapers, homeowners, and various public works projects can use compost. A lower quality product can be used as daily cover at a landfill or in construction projects, road building, or mine reclamation. Landfill operators can also use compost as final cover to provide a cap which will help establish the plants required to reduce percolation and erosion.



Composting is preferred to landfilling or incineration as a solid waste management method because it recycles organic wastes into a useful product. Waste managers should consider source reduction of organic wastes (leaving grass clippings on the lawn) and reuse (using organic wastes as mulches or bedding) to composting.

Composting can occur on a small scale in the backyard, or in small- or large-scale municipal operations. All composting operations benefit from pre-composting processes such as grinding, plastic bag removal, and inspection of the incoming waste. Post-treatment such as screening improves the quality, and thus the marketability, of the final product. Common municipal composting methods are outlined below.

**Turned windrows** are elongated piles 6-10 feet high, 10-20 feet wide and as long as needed. The windrows are turned regularly to control moisture and temperature, and to provide the necessary oxygen for aerobic decomposition. Operators can do this with a front-end loader or a specialized compost turner. The piles will heat to about 140 degrees Fahrenheit even if the outside temperatures are below freezing.

Turned windrows are the most common method of municipal composting for green waste. This method will produce a finished product in 12-24 months under most Montana conditions. The costs are competitive with landfilling. This method is currently being used in several Montana communities.

**Aerated static piles** follow similar principles as the windrow methods except the aeration is accomplished by a network of perforated pipes under the piles. Because air is drawn or blown through the piles by fans or blowers, operators do not have to turn the piles. Aerated static piles are commonly used for composting treated sewage sludge, food waste, and high volumes of fresh grass clippings where aeration and temperature control are crucial. A bulking agent such as wood chips, yard waste, shredded paper, or sawdust is needed to increase aeration and add carbon.

The additional equipment makes this a more expensive method of composting than windrows. It may be cost-effective for communities that wish to co-compost sludge, food wastes, and yard wastes.

**In-vessel systems** are the most mechanized and expensive composting systems. There are a variety of these indoor or containerized systems commercially available. The raw wastes are placed in large containers with built-in aeration and mechanical mixing systems. These highly mechanized systems produce compost very quickly, often in a matter of weeks. Some in-vessel systems accept mixed MSW. Composting mixed municipal solid waste (MSW) may create offensive odors and the final product is usually of poor quality due to plastics, metals, hazardous materials, and other inorganic components contained in mixed MSW. In-vessel systems require a high front-end capital investment.



**Bioconversion**, unlike the other composting methods described above, is an anaerobic process. The digestion occurs in an enclosed tank without oxygen and produces a liquid organic fertilizer, methane gas, and other by-products. If bioconversion proves feasible in Montana, it may provide another composting option. The process does not generate leachate or cause odors, and it produces a nutrient rich product. Cost estimates are not available on this relatively new process.

### Environmental Issues

The primary problem associated with composting is the odor which can result from improperly run operations. Operators can control odor by better pile management or air filtration. Odors are generally not a problem in low-technology operations involving yard waste only, as long as piles are properly turned. Odors can result when grass clippings begin decomposing in plastic bags. Municipalities may wish to restrict yard waste to bulk containers which are emptied, or paper bags which can be composted.

Heavy metals contamination can be a problem with mixed municipal solid waste (MSW) and sludge composting, resulting in a product which should not be used in food-producing applications. Most pesticides do not persist through a proper composting process, but research is not conclusive on some of the more persistent agriculture pesticides.

Composting operations have the potential to produce leachate when excess water moves through the compost leaching organic nutrients from the piles. The leachate can contaminate ground and surface waters. Operators can control leachate production by proper site selection and preparation, and proper operational practices.

When a second or third waste stream, such as sewage sludge or large amounts of food waste, is added to a yard or feedlot compost operation, the system becomes more complex. The potential for leachate production, heavy metals contamination, and public opposition increases. Animal wastes contain proteins, fats and oils that are difficult to degrade, may attract pests, and may carry microbial pathogens. Such co-composting operations will require more money, time, attention, and equipment, and will be more carefully regulated by the Solid Waste Management (SWM) Program.

Composting reduces problems associated with landfilling. Compostable materials often are the primary source of moisture in the landfilled waste stream. The elimination of these wastes can result in a reduction of leachate generation at landfills. Organic materials are also the source of methane gas, one of the primary air pollutants produced at landfills. Methane is produced in insignificant amounts during aerobic composting.

Composting also provides a valuable soil amendment with numerous uses. It can help in the reclamation of environmentally damaged areas resulting from agriculture, mining, and natural causes.

### Economic Issues

The more complex the system and the more waste streams being composted, the higher the costs associated with setting up and operating a compost program. A simple yard waste windrow system can be operated using existing equipment, labor, and space for minimal cost. Because of the high costs of in-vessel systems, they are not expected to be widely used in Montana where other, less expensive, waste management options are available.

In addition to costs of equipment and facilities, costs of yard waste pick-up is a consideration. This will not be a factor if a municipality already has separate yard waste pick-up, if backyard composting is implemented, or if self-haul of yard waste is required for a municipal composting system.

Decision-makers must also figure into the economic equation, the deferred cost savings of not landfilling the compostable waste. Communities will save on weight-based fees associated with landfill disposal. In addition, they will prolong the life of their landfill, delay the costs of building and licensing a new one, and have ready access to low-cost final cover.

Operators may also offer a high quality compost for sale to the various markets mentioned above. They will need to give extra attention, however, to compost quality and marketing before counting on income from compost sales.

### Barriers to Composting

1. Public officials and the general public lack knowledge about composting processes and markets and may resist changes in waste management methods.
2. Some composting operations, particularly mixed MSW operations, have problems with odors or product contamination with chemicals or heavy metals.
3. Collection procedures which keep compostables separate from other waste may meet with public resistance or higher costs.
4. While composting operations can be relatively inexpensive, they are not free of costs. Some local communities may perceive they do not have the resources to implement a composting program.

## RECOMMENDATIONS

### **1. Increase education on composting methods and uses of compost.**

Composting provides a good opportunity for increased public involvement in solid waste management. If waste managers want to encourage backyard composting, residents will need instructions on how to construct and operate a backyard system. If waste managers are implementing a municipal system, residents need to understand the benefits and be encouraged to participate.

A yard maintenance public education program can reduce the amount of yard waste at the source and encourage the use of compost in lawn care and gardening. It can promote not only backyard composting, but other yard management methods such as leaving grass clippings on the lawn, planting low-maintenance ground cover, and chipping yard waste for use as mulch. Other educational programs are suggested in Chapter 5, recommendation 1, pages 45 and 45. The SWM Program should increase its educational resources for composting under its mandate to serve as a clearinghouse for integrated waste management issues.

### **2. Increase backyard composting.**

Backyard composting is an important method of composting and should be strongly encouraged throughout Montana because it reduces waste at its source. Backyard composting involves people as active participants in the waste management process. Residents maintain a small scale composting operation in their backyards to convert the yard and food wastes they generate into compost. Communities should promote composting by providing demonstration projects, workshops, and instructional materials; by subsidized composting bins; and by involving community organizations. The SWM Program should promote backyard composting by providing information to community decision-makers.

### **3. Implement windrow composting operations of yard waste.**

Many Montana communities will decide to compost only green wastes because it can be done with the relatively simple windrow method, using existing equipment and labor. This can still result in a significant reduction in waste going to the landfill. Local officials may carry the misconception that composting is a highly regulated activity discouraged by the SWM Program. In reality, the SWM Program does not charge any additional fees to a simple windrow yard waste composting system at a licensed municipal solid waste landfills (MSWLF). The paperwork is minimal. The SWM Program should be more aggressive in its encouragement of composting as a method of waste management, by providing informational materials, inquiring about composting plans during inspections, and informing communities that they can realize a reduction in their annual license renewal fees by composting.



**4. Develop a comprehensive marketing strategy.**

Many people hold a common misconception that markets for compost do not exist. Compared to other recycled commodities, compost is a recycled product for which local markets are readily available. With the help of a task force, the SWM Program should develop marketing strategies aimed at expanding availability of compost to potential end-users. It should set up a public access data base with the information. The SWM Program should also encourage a state policy to use compost for highway, construction, and reclamation projects. The state should include compost requirements in bid specifications on such projects.

**5. Encourage private/industrial composting operations.**

There are potential waste disposal savings and business opportunities in composting. The wood products industry has shown interest in composting some of their wastes. Some stockyards are examining composting as a means of controlling odors and other potential pollution problems. Private firms may wish to develop composting operations and contract with governmental entities to grind brush and turn piles on a regular basis. The SWM Program should encourage these efforts. It should clarify that existing tax incentives for recycling also apply to composting. The state should give additional financial incentives for composting operations or the purchase of compost by private business.

**6. Provide grants or loans to communities to implement composting programs.**

The machines needed to grind oversized materials, turn compost piles, and screen the final product are readily available. However, many small governmental entities may not be able to afford them. The state should make grants or loans available for several of these smaller entities to jointly purchase the mobile equipment needed for composting (see, Chapter 8, Recommendation 5, p. 70).

STRATEGIES FOR CONSIDERATION

**1. Prohibit mixed municipal solid waste (MSW) composting operations.**

Recent reports discourage mixed MSW composting which is most commonly done in in-vessel systems.<sup>31</sup> The resulting compost is of significantly lower quality and marketing becomes more difficult. Mixed MSW composting also conflicts with other elements of the waste management hierarchy, such as source reduction, reuse, and recycling. The facilities are expensive and need assurance of minimum waste flow. They increase public opposition to composting because odors are difficult to control. Because the wastes are co-mingled, separation of recyclables is difficult and quality is lowered. Until the technology is further



developed, the SWM Program should not encourage mixed MSW composting in Montana. Green waste composting of source-separated materials fits in with the waste management priorities and results in a more useful product.

Some Solid Waste Plan Advisory Committee (SWPAC) members argue that the state should not prohibit any particular processes. Technologies and procedures can change in a way that minimizes problems. If the SWM Program is concerned with product quality, it should require testing of compost from all facilities to ensure that minimum contamination levels are not exceeded. If it is concerned about odors, it should require performance standards.

## **2. Ban yard waste from landfills.**

Numerous states have banned yard waste from landfills by law to encourage composting, and save landfill space. Yard waste bans may carry extra costs for separate collection and impact local citizens who will have to handle the banned materials in some other manner. Waste facilities will need to increase their ability to handle the compostable waste. Disposal bans are discussed further in Chapter 8 on page 71.

### Endnotes

29 EPA, *Decision-Makers Guide To Solid Waste Management*, Office of Solid Waste, 1989, p 25

30. Ibid, p. 81

31 Stephen A. Hammer, *Garbage in/Garbage out? A Hard Look at Mixed Municipal Waste Composting*, New York Environmental Institute, October 1991



## CHAPTER 10. LANDFILLING

**Policy:** The State of Montana will regulate all landfilling of solid waste in Montana and enforce laws to protect the public health and welfare of Montana citizens. Landfilling is a lower priority than source reduction, reuse, composting, and recycling as a method for solid waste management.

**Goals:** Space in environmentally-sound landfills will be maximized by reusing, recycling, and composting all resources that can practically be recovered from the waste stream.

All landfills will be licensed and regularly inspected by state officials. The landfilling of waste will be done in a manner that protects the public health, welfare, and the environment and complies with all state and federal regulations.

The volume of hazardous waste that is landfilled will be lessened: in the case of wastes exempted because they originate in households or small quantities--through management by source reduction, reuse, and recycling; and for those wastes regulated under state and federal statutes through--a) screening programs for preventing such wastes from being disposed of in municipal solid waste facilities, and b) the use of licensed treatment, storage, and disposal facilities.

### WHAT IS LANDFILLING AND WHY THESE GOALS?

Around the nation, solid waste disposal has traditionally centered on landfilling, or burying waste in the ground. That practice continues in Montana where the Solid Waste Management (SWM) Program estimates that more than 93% of waste is landfilled (see, Chapter 2, p. 20). Because most waste is landfilled, and because there are concerns about current practices and remediation of problems associated with past practices, landfilling was given significant attention in Part I. With good planning, careful attention to environmental problems, and effective public education, the state will be able to continue landfilling as a major part of an integrated waste management system for many years.



Under current policy dictated by federal and state regulations, landfilling has come to mean the entombing of wastes in an airless and waterless grave. This is a departure from the former practice of open dumping and burning which encouraged decomposition, but potentially caused spread of disease through vectors, release of leachate, air pollution, and litter. Sanitary landfills try to prevent those problems, but are creating repositories of wastes that decompose very slowly and that require long-term care and possibly future remediation.

Changing the waste management orientation from landfilling to higher priority methods, requires a waste management policy which allows for disposal of waste only after source reduction, reuse, recycling, and composting programs have been implemented. After all those processes, however, there is still a percentage of the solid waste stream remaining for disposal. Landfilling is the only method of final disposal that is currently practical.

### Environmental Issues

Across the nation, landfills that have failed to observe protective standards for siting and operation have created severe environmental problems. The U.S. Environmental Protection Agency's Superfund Program estimates that 22% (more than 260) of the sites on its National Priorities List (NPL) are, or used to be, municipal solid waste landfills (MSWLFs)<sup>32</sup>. While none of these is located in Montana, 24 landfill sites in the state are of concern to the State Superfund Program and will be investigated for possible listing.

As water moves through toxic and hazardous materials, as well as organic materials which have accumulated in a landfill, it picks up dissolved and finely suspended particles and forms a "toxic soup" called leachate. The major environmental concern of landfills is the potential for leachate generation, migration, and subsequent contamination of ground water. There is evidence that leachate has migrated from some landfills in Montana and has impacted ground water quality.<sup>33</sup> The extent of contamination is unknown. Since 45% of Montanans depend on ground water for their drinking water supply<sup>34</sup>, potential contamination from landfill leachate is a growing concern. The SWM Program must enforce landfill design requirements which minimize leachate generation and migration.

The environmental impacts of landfills depend primarily on what goes into them. Hazardous wastes from households and unregulated commercial sources (see, Chapter 12), which comprise less than 1% of the waste stream, present the greatest risks. Increased monitoring of incoming wastes and refusal to accept hazardous substances would make landfills a much safer waste disposal option.

The state has established regulations for the monitoring of regulated hazardous wastes and polychlorinated biphenyls (PCB) waste to prevent their disposal in municipal landfills. Operators of MSWLFs are presently required to undertake a detection program for screening incoming wastes for regulated hazardous and PCB-containing wastes. Screening programs



should include random inspections of waste and landfill personnel training, or other approved steps that insure incoming loads do not contain regulated hazardous or PCB waste. The SWM program has drawn up suggestions for landfill managers to use in developing their waste screening programs.

MSWLFs cause other potential environmental problems. They can produce explosive gases, such as methane. Litter, dust, noise, and disease vectors can all be problems in improperly run landfills. Adequate enforcement of new methane monitoring requirements and operational criteria under 40 CFR Part 258 and current state regulations should control these problems. Methane produced at MSWLFs can be used as a natural gas fuel.

Many factors affect the risks of landfills to human health and the environment. Among them are annual precipitation, proximity of human populations, sensitivity of environmental resources, and the effectiveness of environmental control equipment.

#### Economic Issues

Currently land disposal fees in Montana are low compared to other parts of the country. In many cases, the public is unaware of the true costs of disposal. These apparently low costs are one of the barriers to waste reduction and recycling activities in the state. Local waste managers should consider new fee mechanisms and rate structures (Chapter 5, page 49).

Because of increasing environmental regulation, the cost of landfilling is rising dramatically (see, Chapter 3). The costs of a new MSWLF include capital and interest during development, operations and maintenance, and collection and transportation. Significant economies of scale can be achieved by building one large, rather than several small, facilities.

### LANDFILL OPERATOR TRAINING

Operational practices at MSWLFs can have a major impact on environmental and public health concerns. Most landfill operators in Montana have been "trained" on the job and are not certified. The SWM Program believes that requiring certification of landfill operators would improve landfilling practices and standardize operations around the state, but current laws and rules do not contain this requirement.

The Department has contracted with the Montana Association of Counties (MACo) to provide an education and certification program for Montana landfill operators. The training, which was conducted in October 1992, substantially complied with the existing "Manager of Landfill Operation Training and Certification Course" developed by the Solid Waste Association of

North America, and took into account the requirements of applicable Montana laws and regulations. The SWM Program reviewed and approved the curriculum. Thirty-nine waste managers in Montana took the course, but the number certified is unknown.

In addition, MACo has offered several continuing education courses on specific waste management issues. One course on handling of refrigerants was conducted on November 12, 1992. A second course on April 27-28, 1993 focused on Landfill Closure, financial assurance and long-term care. A third session on December 2-3, 1993 offered information on monitoring ground water and methane. The SWM Program intends to continue offering training on a regular basis and strongly encourages landfill operators to take courses and receive certification.

## RECOMMENDATIONS

### **1. Increase public education about landfilling.**

Public opposition to new landfills has been increasing in recent years. Increased educational opportunities will help the public understand the environmental hazards of landfilling and the attempts to control them. It will help the public understand the changes occurring in landfill practices and the necessity of landfills as a disposal option. Any source reduction, reuse, recycling, and composting public education program should include information on landfilling, as part of an integrated system. The Solid Waste Management (SWM) Program should increase its educational resources under its mandate to serve as a clearinghouse for integrated waste management issues.

### **2. Evaluate other priority waste management methods in the application process for new landfill licenses.**

Waste managers should consider all waste management methods prior to siting a landfill. To facilitate this, the SWM Program should develop a mechanism for all landfill applicants to evaluate the potential for source reduction, reuse, recycling, and composting options during the application process. The evaluation would provide information to local waste managers.

### **3. Increase communication between state and local solid waste officials.**

In order to make good decisions, local officials need adequate and accurate information about laws and regulations relating to both Class II and Class III landfills. The SWM Program should expand its efforts to increase communication and to provide needed information in a systematic, consistent manner.

**4. Examine current enforcement practices and pursue methods for increasing effectiveness.**

Laws and rules protect the public health and the environment only if enforcement is effective. The SWM Program does not currently have rules governing the clean-up of contaminated landfill sites. The program will adopt rules to implement and enforce corrective action and remediation measures at solid waste management facilities. In addition to establishing corrective action procedures and remediation standards, the program will examine its enforcement capabilities and procedures.

**5. Increase training opportunities for landfill operators and require certification.**

The SWM Program will continue to provide regional training and certification courses similar to those provided under contract with MACo in 1992. The courses will help local waste managers learn good operational procedures, evaluate the potential for use of newly developed technologies, and implement state regulations upholding 40 CFR Part 258. In addition to offering the courses, the SWM Program should require certification of landfill operators. It will evaluate its authority to do so, and support legislative or regulatory changes as appropriate.

**6. Evaluate new technologies for landfill design and other alternatives.**

Technologies for improving landfill design have primarily focused on safe containment of wastes and restriction of water infiltration and leachate release. These include the development of design and construction techniques for compacted-soil, synthetic, geosynthetic, and composite liners; drainage layer materials such as geotextiles; leachate collection systems; capping materials; and landfill gas controls. The other prominent area of technological advance and regulation is environmental monitoring of landfill sites, particularly ground water and explosive gases.

In addition, new processes for treatment of waste to yield high value products are being explored around the country. Methane is being extracted for use as a fuel. Processes are being developed to increase methane production from MSW. Experiments on biogasification, acid hydrolysis, and alcohol fermentation to produce ethanol, energy, and enriched plant growth are being studied. Specific waste streams are being tested for treatment with bacteria and biologically engineered organisms in the rapidly growing field of biotechnology. The SWM Program should establish a systematic program for evaluating new technologies and passing this information along to waste decision-makers.<sup>35</sup>

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### Endnotes

- 32 O'Reilly, James F., *State and Local Government Solid Waste Management*, Clark Boardman Callaghan, Deerfield, IL, 1991, 9:02
- 33 Ground water sampling data, SWM Program files.
- 34 Environmental Quality Council, *SJR 19 Interim Study of Solid Waste Management*, Report to the 52nd Legislature, January, 1991, p. 12
- 35 The National Center for Appropriate Technology (NCAT) in Butte, Montana, is one resource for such research



## CHAPTER 11. INCINERATION

- Policy:** The State of Montana will regulate solid waste incineration which may occur in Montana and enforce laws to protect the public health and welfare of Montana citizens. Incineration and landfilling are the lowest priority methods for solid waste management.
- Goal:** Waste will not be incinerated unless source reduction programs have been implemented; until reusable, recyclable, and compostable materials have been removed; and only if landfilling is not feasible.

### WHAT IS INCINERATION AND WHY THIS GOAL?

Incineration of waste has a place on the hierarchy of waste management methods because of its potential to reduce the volume and weight of waste, and to produce energy. The U.S. Environmental Protection Agency (EPA) estimates that nearly 75% (by weight) of municipal solid waste (MSW) is combustible, and that the combustion of MSW can reduce its volume by 70-90%.<sup>36</sup>



Incineration is a waste treatment method, rather than an ultimate means of disposal. While there is some potential to recover metals from ash for recycling, most of the 10-30% that remains, must still be discarded in a landfill.

Incineration, along with landfilling, is the lowest priority on Montana's waste management hierarchy. In many communities nation-wide, plans for incinerators have been stalled or abandoned as they have become more expensive to build and operate and have met with increasing public resistance. Although waste managers can realize space savings by incinerating wastes prior to landfill disposal, the process has some adverse environmental consequences.

Incineration can also interfere with source reduction, reuse, recycling, and composting which are all higher priorities for waste management. It provides little incentive for consumers to sort, separate, and reduce their waste. Policy-makers could apply the money spent on an incinerator to higher waste management priorities. In addition, waste-to-energy incinerators need a steady and guaranteed supply of garbage in order to meet energy supply commitments. This can reduce the incentive to initiate the waste reduction measures described in previous chapters. Communities considering building an incinerator should base their waste flow agreements on estimated waste remaining after implementation of source reduction, reuse, recycling, and composting programs.

Several incinerator technologies are outlined below. There is considerable variation in the specific techniques and arrangements employed in each technology, but the basic operating characteristics are similar.

**Mass burn combustors** incinerate mixed municipal solid waste (MSW) except those items which are too large to be fed into the unit. Plant capacities range from 100-3,000 tons per day (tpd).

**Modular combustors** are small mass burn facilities which operate with a two-stage process. The first burn, under starved-air conditions, produces combustible gasses which are then used to fire the second burn. Plant capacities range from 15-400 tpd.

**Refuse-derived fuel (RDF)-fired combustors** burn pre-processed MSW. The waste may have been sorted to remove metals, glass, and other non-combustible constituents, which may then be recycled. It may have been shredded, screened, or pelletized depending on the type of burning process it will undergo. Plant capacities range from 600-4,000 tpd.

**Fluidized-bed combustors** burn pre-processed MSW in a turbulent bed of heated non-combustible material such as sand, limestone, silica, or alumina.<sup>37</sup> This relatively new technology adopted from industrial waste management, may provide greater control of air emissions. Plant capacities are estimated to be 300-1,000 tpd.

**Waste-to-energy incineration** is accomplished through any of the models described above, often using "waterwall" combustion chambers. The walls contain steel pipes filled with circulating water which produces steam when heated. The steam may be sold or used to drive turbines to generate electricity. Most new incinerators are designed to have waste-to-energy capacity.

### Environmental Issues

Despite the use of best available control technology (BACT), air emissions from incinerators contain a mixture of pollutants with health-related risks. These pollutants include particulate matter, sulphur dioxide, nitrogen oxides, corrosive acid gases, heavy metals, and chlorinated organics (e.g., dioxins and furans).<sup>38</sup> The best ways to control these pollutants are to remove contaminating materials prior to combustion, use BACT, and maintaining good combustion practices. There is controversy, however, over whether incinerators can maintain consistently and uniformly high temperatures to achieve control of the pollutants. Technological advances in BACT are continually being made to further reduce air emissions, but it is difficult to maintain continuous, complete combustion conditions.

Dioxin, chromium, and cadmium emissions from starved-air (modular) combustors are significantly less than emissions from other types of combustors. The operating temperatures of the secondary combustion chamber of modular air combustors enhance the destruction of chlorinated organics. However, the higher combustion temperatures conversely promote emissions of heavy metals and nitrogen oxides.<sup>39</sup>

The more air emissions are controlled, the more fly ash is produced that may also contain harmful constituents. Bottom ash contains non-combustible materials which may include heavy metals derived from batteries, electronic equipment, and plastics. Harmful constituents from both fly ash and bottom ash have the potential to leach into ground water after the ash is disposed of at a landfill.

Pre-sorting the waste stream prior to combustion is the best control for all environmental concerns. The sorting reduces the concentration of harmful constituents in the bottom and fly ash, as well as in the air emissions.<sup>40</sup>

New technologies are currently being explored to incorporate incinerator ash into concrete building materials. In addition, new processes of vitrifying, or gassifying, incinerator ash exist and are currently being studied. These technologies may immobilize hazardous constituents in useful products.

#### Economic Issues

Due to concerns about air emissions and ash disposal, environmental standards for construction of incinerators are extensive and very expensive to meet. Because of the high costs, incinerator technologies require large volumes of combustible waste to meet efficient economies of scale. It is questionable whether Montana communities produce enough garbage to feed a modern incinerator, especially after waste reduction measures are implemented.

Waste decision-makers must realize and evaluate all pertinent costs. These costs include the capital cost of constructing and operating the incinerator, costs of maintaining pollution control equipment, costs of ash disposal, and revenues generated from energy production.

### RECOMMENDATIONS

#### 1. Increase educational activities.

Public opposition to incineration has been strong and well-organized around the country. An integrated waste management public education program can educate residents on incineration along with other waste management options. It should include information about the potential advantages and disadvantages of incineration, so that citizens are better able to make informed



decisions when siting issues arise. The Solid Waste Management (SWM) Program should make information on incineration available to local decision-makers in its role as an informational clearinghouse for integrated waste management.

**2. Consider the entire waste management hierarchy before choosing incineration.**

Communities must strive for environmentally sound waste management methods, with primary emphasis on source reduction, reuse, recycling, and composting. The SWM Program should develop a mechanism which requires communities to carefully examine the higher priority waste management methods before investing in incineration.

**3. Review economic and technology research on incineration.**

The possibility exists that the technology for environmental controls will improve and become more cost-effective. For this reason, incineration should remain on the hierarchy as a method to consider, although it remains the lowest priority. The SWM Program should continue to investigate the economics of incineration for Montana and assess new technological developments.<sup>41</sup>

**4. Develop standardized, coordinated licensing and regulatory activities between the appropriate bureaus within the Montana Department of Health and Environmental Sciences (MDHES).**

Current licensing and regulatory requirements for new and existing incineration facilities are shared between the Air Quality Bureau and the SWM Program (within the Solid and Hazardous Waste Bureau). Improving consistency and coordination will help ensure environmental protection, increase efficiency in the application process, and help the public have more confidence that MDHES is adequately regulating incineration.

**5. Divert toxic and recyclable materials prior to incineration.**

Solid waste managers should consider the advantages of source separation prior to incineration. Montana may wish to pass laws or implement regulations which require source separation. By removing those materials which release toxic constituents when incinerated, environmental concerns will be lessened. The additional removal of any remaining reusable, recyclable, and compostable materials would encourage waste management methods in line with the state's priorities. The SWM Program should investigate legislative or regulatory channels for this requirement.



**6. Increase regulation of small incinerators operated by businesses and institutions.**

Solid waste incinerators which are designed to burn less than 200 lbs/hour have not been regulated by the Montana Department of Health and Environmental Sciences. A law passed in 1993 requires that new solid waste incinerators of any size obtain an air quality permit. Existing small incinerators are exempt from the new law. These small incinerators are usually operated by hospitals, grocery stores, retail centers, or other commercial establishments. Environmental concerns of small incinerators, though lesser in magnitude, are similar to those created by large incinerators. In addition, use of these small incinerators hinders recycling goals. The SWM Program should support legislation to regulate all small incinerators.

Endnotes

36. EPA, *Decision-Makers Guide To Solid Waste Management*, Office of Solid Waste, 1989, p 95.

37. U.S. Environmental Protection Agency, *Municipal Waste Combustors-Background Information for Proposed Standards 111(b) Model Plant Description and Cost Report*, Radian Corporation, EPA-450/3-89-27b, August, 1989.

38. Thomas F. DePaul and Jerry W. Crowder, *Control of Emissions from Municipal Solid Waste Incinerators*, Noyes Data Corporation, 1989.

39. Ibid

40. Ibid

41. The National Center for Appropriate Technology (NCAT) in Butte, Montana, is one resource for such research.



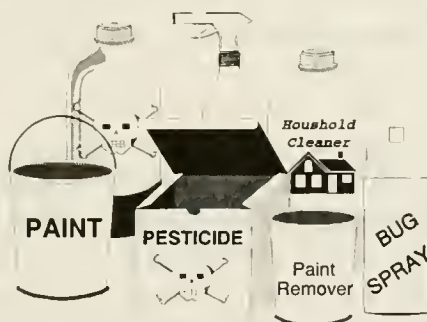
## CHAPTER 12. SPECIAL WASTES

**Policy:** The State of Montana will promote an integrated approach to the management of special wastes. When practical, source reduction, reuse, composting and recycling will be implemented prior to landfilling and incineration.

### HOUSEHOLD HAZARDOUS WASTES AND CONDITIONALLY EXEMPT SMALL QUANTITY GENERATORS OF HAZARDOUS WASTES

**Goals:** Every Montana community will have a program aimed at identifying and reducing the amount of household hazardous waste (HHW) going into the waste stream.

All conditionally exempt small quantity generators of hazardous waste (CESQGs) will be implementing source reduction, reuse, and recycling programs. Remaining hazardous wastes will be disposed of in a treatment, storage, and disposal facility (TSDF), not in a landfill.



### WHAT ARE HHW AND CESQG WASTES AND WHY THESE GOALS?

A waste is considered hazardous by the EPA if it has one or more of the following characteristics, or if it appears on any one of four lists of over 400 hazardous wastes contained in the Resource Conservation and Recovery Act (RCRA).<sup>42</sup>

Ignitable - It is easily combustible or flammable (paint wastes, solvents, or degreasers).

Corrosive - It dissolves materials such as metals, or burns the skin (rust removers, waste cleaning fluids, and waste battery acid).

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Reactive - It is unstable or undergoes rapid or violent chemical reaction with water or other substances (waste bleaches and other oxidizers).

Toxic - It contains high concentrations of heavy metals (lead, cadmium, mercury, etc.) or specific pesticides that could be released into the environment.

"Acutely hazardous" wastes are those which the EPA has determined to be so dangerous in small amounts that they warrant more stringent regulation. Certain pesticides fall into this category.

The Montana Solid Waste Management Act defines household hazardous waste (HHW) as a product commonly used in the home that due to any of the above characteristics is dangerous to human health or the environment. Almost every home produces waste that could be hazardous if improperly discarded. The EPA estimates that every year U.S. consumers discard 600,000 tons of hazardous waste. HHW includes cleaning, home maintenance, automotive, personal care, and yard maintenance products<sup>43</sup>. A large portion of the category called HHW is made up of paint, solvents, pesticides, and batteries.

HHW in any amount is exempt from state and federal hazardous waste regulations simply because it is generated by households. It may be legally disposed of in a municipal solid waste landfill (MSWLF), an incinerator, or a sewage treatment plant. However, the constituents may be identical to wastes from industrial and commercial sources which come under stringent regulations.

As a result of doing business, a company may generate hazardous wastes that must be handled and disposed of more carefully than the rest of its waste stream. The handling, transportation, storage, and disposal of these substances are regulated by stringent federal law and state regulations. Company officials must send the wastes to a treatment, storage, and disposal facility (TSDF) which is designed and permitted to accept hazardous wastes. Generally, if these substances are being legitimately recycled, they are subject to less stringent requirements. Such wastes are not the subject of this plan.

However, if the company generates less than 220.5 pounds (approximately 100 kilograms or 25 gallons) of hazardous waste, and less than 1 kg (approximately 2.2 lbs) of acutely hazardous waste per month, it is "conditionally exempt" from the hazardous waste laws and regulations. These companies have the responsibility of identifying their hazardous wastes and never accumulating more than 1,000 kg on their property. However, they may dispose of these hazardous wastes in a MSWLF, if the owner will accept it. Because the wastes may be identical to those hazardous wastes requiring stringent regulation if generated in larger amounts, the Solid Waste Management (SWM) Program and the EPA recommend disposal in a TSDF.



The SWM Program recognizes HHW and CESQG waste as major environmental problems associated with waste disposal. Their disposal involves serious environmental and health risks. Poured down storm sewers, they can flow directly into rivers and aquifers where they may decompose very slowly and accumulate in the food chain, or react to form hazardous compounds. In a landfill, they commingle with other waste and may produce leachate. In a poorly sited or improperly operated landfill, leachate can leak into the environment, contaminating local water supplies. HHW and CESQG waste can also cause fires, explosions, or release toxic fumes. Their incineration could cause explosions or releases of toxic fumes into the atmosphere. Toxic material could also become concentrated in the fly ash or bottom ash<sup>44</sup>.

In addition to disposal concerns, improper use can cause toxic health effects and other problems. Improper storage can enable chemicals to leak into the environment causing dangerous chemical reactions, toxic health effects, or environmental degradation<sup>45</sup>. The risks associated with HHW and CESQGs can be significantly reduced through education, reduction, and proper use, storage, and disposal techniques.

#### Barriers to HHW and CESQG waste management

1. Since HHW products are so common and used in so many different situations, consumers may assume they are not very hazardous.
2. CESQGs may lack awareness of the hazardous nature of the products they use. Generators may not have the time, interest, or resources to implement new techniques.
3. Because these wastes are generated in small quantities and are heterogenous, economies of scale are hard to achieve in reuse or proper disposal. Different management methods may be needed for the large variety of compounds.
4. Few markets exist beyond community reuse and exchange. Industry is not equipped to accept the small, heterogenous quantities of HHW.
5. Labeling is often inadequate. Quantities of the active ingredients may not be specified. Inactive ingredients are usually not listed, despite being hazardous (e.g., solvents). Long-term (chronic) hazards are usually not specified. Proper disposal instructions are often minimal.

## RECOMMENDATIONS

**1. Expand educational programs for CESQGs and consumers and retailers of HHW to encourage source reduction, use of non-hazardous alternatives, reuse, and recycling.**

Company officials and waste managers should implement education programs on integrated waste management for all CESQGs, including the following types of businesses: building cleaning and maintenance, construction, educational shops and labs, equipment repair, funeral services, wood manufacturing, preserving and refinishing, laboratories, laundries and dry cleaning, transportation terminals, pesticide use and application, printing, vehicle maintenance, metal workers, and various types of manufacturing.

Collectively, consumers can have a significant impact on the types of products offered for sale by refusing to buy HHW products and by making their choices and objections known to retailers and manufacturers. Consumers should give away products for reuse rather than discarding them and learn how to treat wastes for safer disposal. Waste managers can also participate in this education.

The Solid Waste Management (SWM) Program should work with affected businesses and other groups doing waste education work to increase the materials and workshops available to consumers and small businesses and to promote educational programs and small business training programs. The SWM Program should serve as an information clearinghouse by having programs to transfer information and technologies as well as provide information. Specifically, it can build databases of safe disposal methods for specific waste streams, including waste reuse and reduction. The SWM Program can serve as an intermediary between the EPA's technology transfer program and other information programs and the generators themselves. The SWM Program can make regional waste exchanges more available. This information, as well as regulatory assistance, should be highly advertised and be available in print, hotline and electronic formats. The program should fund state-wide media efforts, materials production, and should assure that its program personnel are well informed on these issues.

**2. Encourage community collection events and waste exchanges.**

To keep a portion of HHW and CESQG waste from the landfill, communities can set up collection days, asking residents and small businesses to bring their hazardous wastes to a collection point. Waste managers or public interest groups must plan these collection events carefully and limit their scope to specific identifiable products. The community will need to contract with a hauler to move the wastes to a TSDF designed and permitted to accept commercial hazardous wastes. Since there are no such facilities in Montana, transportation costs can be high. Such programs can be difficult to control and very expensive.

A recent interpretation of an existing federal rule by the EPA exempts any amount of hazardous waste collected from CESQG's and households together from extensive regulation. Its purpose is to encourage and protect HHW collection programs which often are overwhelmed by large quantities of hazardous wastes from CESQG's.

A significant portion of HHW is paint. Communities can organize an exchange where residents bring in paint they no longer want and pick-up what they need. Remaining paint should be given to worthy community projects, or mixed and resold as a base paint. Swaps may also work for unused cleaning products, pesticides, or other products which the original owner cannot use.

Waste exchanges are a decentralized way to encourage reuse of materials. They are described in Chapter 7 on page 59.

The SWM Program should provide information on how to set up HHW collection events and waste exchanges by informing communities of other groups with information and experience, by helping communities coordinate such events to lower transportation costs, and/or by providing grants to help offset the costs.

**3. Establish model demonstration sites and a "green seal of approval" program for CESQGs.**

Existing businesses which are employing integrated waste management practices can serve as model demonstration sites for businesses of their type. Such modeling will encourage other companies to implement similar practices. Businesses can exchange information on costs and benefits associated with integrated waste management practices. The SWM Program should work with other organizations to identify model businesses and foster communication between businesses.

The SWM Program should sponsor an award program for small quantity hazardous waste generators. By placing a "green seal" in the window, proper waste management is advertised to customers and encouraged in competitors. It is important for the award to be worth something to a business by not being awarded indiscriminantly.

**4. Establish a public/private partnership for state-wide collection and transfer of hazardous wastes from CESQGs and households.**

The Montana Department of Health and Environmental Sciences (MDHES) has the authority to build and operate a facility for the collection and disposal of hazardous wastes. The 1985 legislature appropriated \$800,000 for such a project. A MDHES study recommended that a state-owned, privately-operated facility be built. The funds, however, were reappropriated at



the Governor's recommendation and the project was never initiated. The SWM Program could seek a legislative appropriation to update the study and implement the project.

A mobile hazardous waste collection van can lower transportation costs, which can be the largest cost of hazardous waste collection. Communities could be notified of the day the van would be in a neighborhood, and instructions for collection would be given. An alternative often used for small businesses, and sometimes for communities, is a milk run by a hazardous waste treatment company. A regular collection is scheduled for a string of generators in an area so collection can be done in one run. For more common hazardous wastes, many companies only require a one-time waste characterization, rather than one for each collection. The costs of these types of efforts would drop as more communities become involved.

**5. Implement an annual fee on retailers, distributors, or manufacturers who sell hazardous products.**

Money from the annual fees paid by those who sell hazardous products would go towards the education and collection programs identified above. The SWM Program should support legislation addressing this issue.

**6. Require that CESQGs notify landfill operators prior to hazardous waste disposal.**

Federal regulations 40 CFR Part 258 require that landfill operators prevent any regulated amounts of hazardous wastes from entering a landfill and document all inspection, training, and notification procedures. They must also prevent disposal of bulk liquids. While these regulations do not prevent CESQG waste disposal, record keeping requirements will necessitate disclosure.

STRATEGIES FOR CONSIDERATION

**Implement landfill bans on hazardous wastes from CESQGs.**

**Regulate either landfilling or sale of certain HHW products.**



## BATTERIES<sup>46</sup>

**Goal:** Batteries will not be deposited in landfills.

### WHAT ARE BATTERIES AND WHY THIS GOAL?

Batteries, or cells, are a convenient, versatile and portable form of power. Each U.S. resident, on the average, disposes of at least eight dry cells, totalling nearly 2.5 billion a year across the country. The main components of a battery are two electrodes, which usually are composed of a metal. Several of these metals--cadmium, lead, and mercury--are especially toxic and may pose a hazard to human health after the cells are discarded. Batteries also contain a corrosive acid or alkaline electrolyte that contributes to the corrosion of cell casings in landfills. When batteries are thrown away, their metals are disbursed to the air and soil through incineration, or to water and soil through dissolution in landfills. In landfills, they may dissolve in leachate and be transported into ground water.

Extrapolating from national figures<sup>47</sup>, Montanans dispose of about 75 million cells yearly. Franklin and Associates reports 65% of the lead, 75% of the cadmium, and 15% of mercury in the municipal waste stream comes from batteries (despite the current 85-90% recycling rate of vehicle batteries).<sup>48</sup> Roughly, this is 1.1 million pounds of lead, 12,600 pounds of cadmium, and 1,600 pounds of mercury in the Montana municipal waste stream (excluding the military and industrial batteries). Mercury, which was used to prevent corrosion of the zinc in alkaline and carbon-zinc cells, has been phased out of these batteries making vast numbers of batteries non-hazardous. A collection program for the remaining types--mercuric-oxide (35% mercury), lead-acid (90% lead), and nickel-cadmium (15% cadmium)--would require transportation to one of several companies that accept these types in order to recover their valuable metals.

### RECOMMENDATION

#### **7. Implement consumer education programs about batteries.**

An education program capitalizing on the many recent positive developments in battery technology could teach proper battery use (maximizing their life and reuse), potential substitutes (rechargeables, and matching the type with the use), recycling opportunities, and proper disposal.

STRATEGIES FOR CONSIDERATION

Monitor proposed federal legislation on batteries.

Ban batteries from the waste stream, and set up a deposit system and mechanism to recover them.

USED OIL

**Goal:** Every community will have a used oil collection system. Used oil will not be spread on the land, deposited in landfills, or poured down drains. Its incineration will be controlled.

WHAT IS USED OIL AND WHY THIS GOAL?

Montana law defines used oil as "any oil that has been refined from crude oil, used, and . . . contaminated by physical or chemical impurities".<sup>49</sup> It may come from automobiles, trucks, or industrial equipment. The EPA estimates that about 200 million gallons of used oil per year is generated by individual consumers ("do-it-yourselfers", or DIYs)<sup>50</sup>. Automotive or industrial uses may generate six times that much. According to a 1988 study, over 450 million gallons of used oil from all sources including DIYs, end up in landfills, sewers, or on the land in the United States each year. Another large, but unknown, quantity is burned at inadequately equipped facilities.<sup>51</sup>



Because of the potential for ground water contamination and the threat of hazardous waste regulations, large generators of used oil usually contract with haulers to remove their waste. It may eventually be burned for energy recovery or re-refined for use as fuel or lubricating fluid. Landfills are prohibited from accepting bulk liquid wastes for disposal. As of March 1993, the EPA prohibits the use of oil as a dust suppressant.<sup>52</sup>

DIYs are far less likely than large generators to handle their used oil in an environmentally sound manner. There are no regulations for used oil disposal from DIYs. The EPA estimates that only 10% of the used oil generated by DIYs is properly collected and eventually recycled.<sup>53</sup> It is often emptied into sewers, dumped directly on the ground, or thrown into the trash and subsequently taken to the landfill. Used oil collection points in Montana are listed in Appendix D.

Used oil can be a serious threat to the environment if not managed properly. When dumped in sewers or storm drains, oil can disrupt treatment plants or discharge directly to surface waters. From landfills or dust suppression applications, oil can find its way to ground water or surface water. Just one gallon of used oil can foul a million gallons of fresh water--a year's supply for 50 people. Films of oil on the surface of water disrupt plant and animal life. Oil has toxic affects on aquatic organisms. Dumped on land, oil can reduce soil productivity.<sup>54</sup>

Used oil is often burned for energy recovery in space heaters of repair shops. Because of the potential for toxic air emissions from contaminants in the oil, this activity is regulated under federal law. The space heater must be designed to have a maximum capacity of not more than 500,000 Btu per hour and must be vented to the outside air. If shop owners only burn oil which they generate themselves or oil from DIYs, it does not need to be tested for hazardous characteristics or meet specification standards.<sup>55</sup>

Re-refining used oil to certified lubricant quality takes only one-third the energy of refining crude to the same standard. A gallon of used oil contains about 140 Btu of energy when burned, and is competitive in price and performance to other fuels. If all DIYs' used oil were recycled, it would save the U.S. 1.3 million barrels of oil per day.<sup>56</sup>

## RECOMMENDATIONS

### **8. Adopt and implement the new federal standards for the management of used oil.**

The EPA adopted a new rule on used motor oil effective March 10, 1993.<sup>57</sup> Among other requirements, the new rule encourages recycling by limiting the regulation of used oil intended for recycling and limiting the liability of service stations that collect used oil. The new rule also prohibits the use of oil as a dust suppressant. The Department of Health and Environmental Sciences will officially adopt the EPA regulation in 1994. The Solid Waste Management (SWM) Program will inform the public and commercial and industrial generators of the new rule and its effect on their operations.

### **9. Implement additional educational programs for DIYs.**

DIYs need to understand the consequences of improper management of used oil and be informed of the collection options available in their communities. The SWM Program should increase its educational efforts by working with other solid waste education groups to produce materials, public service announcements (PSAs), and provide information at other informational forums.



**10. Expand the collection system for DIY's used oil.**

DIYs need to have access to convenient collection points to drop off their used oil. Some communities may want to consider curbside collection of used oil and ordinances requiring proper handling of used oil. An educational campaign is an important part of the collection system.

The 1991 legislature passed a law requiring all retailers of motor oil to post a sign indicating the location of the nearest used oil collector. The SWM Program has distributed signs to retailers of motor oil to help them comply with the law. The SWM Program should increase its efforts to establish used oil collection systems by explaining new rules, actively encouraging local officials and landfill operators to expand community services, and publishing used oil management brochures to be offered to consumers at the point of sale.

STRATEGIES FOR CONSIDERATION

**Ban landfilling of used oils from all sources and increase penalties for improper disposal of used oil.**

**Ban burning of used oil in furnaces or space heaters not equipped with proper pollution prevention devices.**

**Require landfills and/or vendors to accept used oil from their customers or provide an alternative.**

**Tax the sale of new oil and subsidize used oil haulers and recyclers.**

**Require verification of proper disposal from commercial and industrial generators.**

**Require government recycling of used oil and procurement of re-refined and reprocessed motor oil.**



## WASTE TIRES

**Goal:** A comprehensive waste tire reduction and reuse system will be established, eliminating tire stockpiles and achieving a high rate of recovery of waste tires.

### WHAT ARE WASTE TIRES AND WHY THIS GOAL?

According to the EPA about one tire per person is scrapped in the U.S. each year. The figure may be higher for rural states where residents generally have more vehicles, and where distances between urban centers are greater. In any case, at least 800,000 waste tires are generated in Montana in a year. National figures show that despite increased life of tires, disposal rates have grown about 2% a year since 1984. Less than 7% of these scrap tires are recycled, about 11% are incinerated, about 5% are exported, and the remaining 78% are landfilled, stockpiled, or illegally dumped.<sup>58</sup> Montana figures are not available, but the Solid Waste Management (SWM) Program believes that almost all tires are landfilled, stockpiled, or dumped. A few are incinerated and still fewer recycled into new products.



Stockpiled tires may cause environmental and health hazards. Uncontrolled fires produce toxic air emissions and oil seepage to water supplies. Moisture in tire wells can cause mosquito infestations and spread of disease. In landfills, whole tires take up a large volume of valuable space, may collect gas and harbor rodents, and tend to rise to the surface destroying the final cover.

Disposal of tires represents a loss of resources. It takes about 22 gallons of oil to manufacture a new truck tire, but only seven gallons to retread it.<sup>59</sup> Tires have an energy value of 15,000 Btus per pound, which is greater than most coals.<sup>60</sup>

To conserve resources, save landfill space, and reduce the environmental problems associated with tire stockpiles, waste tire managers should apply integrated waste management principles. Source reduction can be achieved by increasing the life of tires through technological advances and consumer education for proper maintenance.

Whole tires can be reused in a variety of ways. When one or two tires are worn out, consumers may replace the entire set of four. The other tires could be used on another vehicle. Many tires can also be retread. Whereas tires from large trucks, buses, and airplanes are often retread, there has been a decline in retreading of passenger vehicle tires. This is primarily due to public misperceptions about safety and durability. Whole tires are also used as breakwaters, highway crash barriers, and for land erosion control.

Old tires can be split and made into floor mats, belts, gaskets, shoe soles, and dock bumpers. They can be shredded and used as a gravel substitute for playgrounds or as light-weight fill for road beds, parking lots, or other construction projects. They can be reduced to "crumb" and used in such products as flooring, truck bed liners, railroad crossings, and mud guards. A major use of crumb rubber is in asphalt for highways. The Federal Aid Highway Act requires the use of rubberized asphalt in 5% of all federally-funded highway projects by 1994. That amount will increase to 20% by 1997.

Finally, old tires can be incinerated for energy recovery. The technology to derive energy from scrap tires has been developed. Whole or shredded tires are being used in other states as a supplemental fuel at power plants, cement kilns, and pulp and paper mills. There are also facilities dedicated solely to burning tires for energy production.

A law passed by the 1991 Legislature established provisions for a 25% tax credit on depreciable equipment purchased for certain recycling activities, including equipment for waste tire recycling. The Montana Tire Dealers Association is drafting a waste tire management bill based on the State of Oregon Used Tire Statutes. This bill should be ready for submittal during the 1995 legislative session.

## RECOMMENDATIONS

### **11. Implement a public education campaign to extend the useful life of tires.**

With education, consumers may choose to buy longer-lasting tires and maintain their tires properly through regular rotation and pressure checks. Education can encourage consumers to buy retread tires by asking them to examine their misperceptions about the safety and durability of retread tires. The Solid Waste Management (SWM) Program should work with other groups to promote public education on extending the life of tires and use of retreads.

### **12. Encourage government use of retread tires.**

In 1988, the EPA issued guidelines for purchasing retread tires in an attempt to stimulate government procurement and increase the use of retreads by both the government and private sectors. The guidelines require all state and local government agencies and contractors that use federal funds to purchase retread tires and tire retreading services to the maximum extent possible. The requirement has been largely ignored in Montana.

The SWM Program should publicize the federal requirement and ask local governments and the Montana Department of Transportation to implement it. The SWM Program should encourage the legislature to pass a similar state requirement.

**13. Develop a program to process scrap tires by assessing a small fee on tires either at the time of sale or vehicle registration.**

The revenue from a fee on tires could fund public education and a county-operated program to collect and process used tires. The program would be similar to the current junk-vehicle program (see, description of program in Chapter 2, p. 23). The state would secure contractors to process the tires. The SWM Program should examine the feasibility and potential funding of such a program for the purpose of cleaning up old tire piles.

In Ontario, Canada, a surcharge on tires intended to promote tire recycling resulted in a large amount of money. However, very little was spent on tire recycling projects because the markets were not well developed. State officials should examine this experience before implementing a program.

**14. Support local micro-businesses that can use waste tires to manufacture products for local or regional markets.**

The SWM Program should work with local economic development corporations to provide low-interest loans and technical assistance. The program should support legislation to increase tax credits for these businesses.

STRATEGIES FOR CONSIDERATION

**Require retailers to take back old tires and verify their disposal methods.**

**Encourage development of the crumb rubber industry and the use of crumb rubber in asphalt and other products.**

**Develop in-state markets which can use tires as fuel.**

**Ban the landfill disposal of whole tires.**



## WHITE GOODS

**Goal:** Every community will have a program for reuse and recycling of white goods. White goods will be diverted from the waste stream prior to disposal.

### WHAT ARE WHITE GOODS AND WHY THIS GOAL?

White goods are large, discarded appliances that are made primarily of metals. They may be either from homes or industry, and include such items as stoves, refrigerators, freezers, air conditioners, water heaters, washers, and dryers. Montana laws and regulations do not mention white goods, or establish specific procedures for handling them. Some white goods are separated for reuse or scrap metal salvage, but many are discarded in landfills with normal MSW. Landfilling of white goods represents a waste of natural resources and landfill space. Scrap processors can recover the metal for reuse in mills and foundries to produce new steel.

The primary environmental concern over some appliances which enter the scrap market or are landfilled, is the presence of chlorofluorocarbons (CFCs) in the refrigerants. These refrigerants must be removed and reclaimed prior to landfilling or crushing appliances. When released into the atmosphere, CFCs break apart, releasing chlorine, which reacts with and destroys the ozone layer of the stratosphere. The loss of ozone may lead to an increase in skin cancer, damage to the immune system, reduction of crop yields, and other harm to plant and animal life. Revisions of the Federal Clean Air Act prohibit the release of CFCs into the atmosphere, require the recycling of refrigerants, and ban certain non-essential uses.

Some scrap dealers are also concerned about the presence of polychlorinated biphenyls (PCBs) in electrical components in a small fraction of old appliances. PCB-containing lubricating oils are a contaminant in the scrap metal process and a potential threat to water supplies when landfilled.

Most often, recycling of white goods is an expense to waste managers. The additional cost of up to \$35 per appliance for removing the CFCs, applies whether the white goods are landfilled or recycled, and thus will not effect the comparative cost-effectiveness of recycling.



## RECOMMENDATIONS

**15. Provide information to landfill operators and the public on the removal of refrigerants containing CFCs.**

The EPA has finalized new rules on the handling of refrigerants containing CFCs with regard to landfill operations. Landfill operators need to know the requirements, including the penalties that can be incurred, and become familiar with the equipment and services available. The Solid Waste Management (SWM) Program should work in coordination with other educational programs to provide the necessary information.

**16. Encourage repair and reuse of white goods.**

Some discarded appliances are still in working condition and should be sold for reuse. Other appliances should be made useable through repair. Reuse and repair centers were discussed in Chapter 7 on page 58.

**17. Fund a public education and collection program for white goods by assessing a tax on appliances at the time of sale.**

A county-operated program to collect and process white goods would be similar to the current junk-vehicle program (see, p. 23). The SWM Program should support legislation to set up the program.

## STRATEGIES FOR CONSIDERATION

**Ban white goods from landfills.**

**Charge residents for curbside pick up and recycling of white goods.**

**Set up state enforcement of CFC reclamation.**

## INFECTIOUS WASTE

**Goal:** All generators of infectious waste will have implemented source reduction, reuse, and recycling programs for their entire waste stream, when practical. These programs and the disposal of remaining infectious waste will be protective of the public health and the environment.

### WHAT IS INFECTIOUS WASTE AND WHY THIS GOAL?

Infectious waste is any waste capable of transmitting a disease to humans. It includes the blood-soaked wastes from patients with infectious diseases, certain laboratory wastes, and health care items designed to cut or puncture. While most infectious waste is generated by hospitals, it may also come from nursing homes, medical clinics, doctor and dentist offices, veterinary clinics, laboratories, homes, and a variety of other settings.



The probability of spreading disease to the public through contact with infectious waste is actually quite low, although it can happen. The microorganisms must be present in sufficient strength and numbers to cause infection; they must have access to the human body; and the human must be susceptible to the infection. The public may perceive the risk to be much greater than it is.

A more serious concern with infectious waste is the safety of waste haulers and landfill operators. Without proper containerization and labeling of infectious wastes, these workers may be injured or infected from exposure to infectious wastes or sharp instruments.

In 1991, the Montana Legislature passed the Infectious Waste Management Act to set management standards for the storage, transportation, treatment, and disposal of infectious wastes. The Act defines infectious waste and requires that generators separate it from ordinary waste at the point of origin, and store it in a secured area in specially marked containers until the waste is rendered non-infectious. Generators must place sharp instruments in rigid containers. Infectious waste which is treated by incineration, steam sterilization, or chemical sterilization, may be disposed of at a municipal solid waste landfill (MSWLF). The Infectious Waste Management Act requires the state licensing board of any profession or facility that generates infectious waste to ensure compliance with the provisions of the Act.

The Montana law essentially addresses the EPA guidelines for Infectious Waste Management.<sup>61</sup> The EPA has not proposed rules in this area. Many states have more stringent regulations than Montana. Some require management plans by generators. Some

define "infectious waste" or "regulated medical waste" more broadly. They may require permitting and extensive record keeping by generators, transporters, and treatment and disposal facilities.

In Montana, infectious wastes are commonly burned in small incinerators that are owned and operated by infectious waste generating health care facilities, often located in urban areas. The Infectious Waste Management Act states that waste managers may treat and dispose of infectious waste through "incineration with complete combustion that reduces infectious waste to carbonized or mineralized ash". The new rules may set more specific standards and assure compliance. Treatment of wastes by steam sterilization is also common in Montana.

Large commercial medical waste incinerators which contract for infectious waste disposal with health care facilities have also been proposed for Montana. The emission requirements for these incinerators are regulated by the Montana Air Quality Bureau and the solid waste aspects of these facilities are regulated by the Montana Solid and Hazardous Waste Bureau.

Perhaps the greatest environmental impact medical facilities have on the waste stream is the large volume of waste they generate, most of which is not infectious. These facilities commonly use disposable items, some of which may be necessary to control infection. However, medical facilities must examine the opportunities for source reduction, reuse, and recycling of all their waste streams, as discussed in Chapters 6-8.

## RECOMMENDATIONS

### **18. Provide educational resources to infectious waste generators.**

Educational resources are available which discuss integrated waste management for medical facilities and provide suggestions on identifying and minimizing their infectious waste. Each facility should appoint a waste management coordinator who should receive training and information on this topic. The Solid Waste Management (SWM) Program should work with licensing boards and industry associations to identify resources and coordinate training programs.<sup>62</sup>

### **19. Assure compliance with the Montana Infectious Waste Management Act.**

The Montana Department of Health and Environmental Sciences (MDHES) must adopt final rules providing more specific requirements for generators, haulers, and landfill operators, clarifying who will enforce the regulations and how they will monitor compliance. Facilities and companies handling infectious waste should appoint a waste coordinator and have a waste



management plan. The SWM Program is working with the Licensing and Certification Bureau and the Air Quality Bureau, all within MDHES, to draft rules for treatment, storage, and disposal facilities, and hospitals.

**20. Set compliance standards and implement a permit system for hospital incinerators.**

Small incinerators at medical facilities, which are designed to burn less than 200 pounds per day, have not been regulated or inspected by state officials. They are often sited in densely populated areas. Environmental concerns over air emissions and ash disposal warrant closer scrutiny. Beginning in 1993, any new incinerator, regardless of size, is required to obtain an Air Quality permit. The SWM Program should work with the Air Quality Bureau and the Licensing and Certification Bureau to set policies or regulations for the operation of existing small incinerators.

## CONSTRUCTION AND DEMOLITION WASTES

**Goal:** All communities will have source reduction, reuse, and recycling programs for construction and demolition waste when practical.

### WHAT IS CONSTRUCTION AND DEMOLITION WASTE. WHY THIS GOAL?

Construction and demolition (C/D) wastes are any material and debris resulting from building, repairing, remodeling, or razing structures. They may be homes, commercial or public buildings, pavements, bridges, or other structures. The materials include steel, asphalt, concrete, brick, masonry, glass, wallboard, wood, rock, piping, insulation, wiring, and plastic.

The percentage of C/D waste in municipal solid waste in Montana is unknown. A recent study in Iowa found that C/D waste comprised about 11.6% of the waste stream. Other states report a range of 3% - 30%.<sup>63</sup> Across the country, most C/D waste is discarded, even though the potential for better uses exists. Other than the reuse that may occur by the contractor on-site, the Solid Waste Management (SWM) Program is unaware of source reduction, reuse, or recycling programs for C/D waste in Montana.

In Montana, most C/D waste is discarded at Class II landfills. Laws prohibit unlicensed on-site disposal of C/D waste on private land. Although much of the material is relatively inert, and could be disposed of in a Class III site, separation is not cost-effective. In some states,



special C/D landfills have been licensed. They are generally regulated less stringently than municipal solid waste landfills (MSWLFs) on the belief that they are less likely to have negative impacts to human health and the environment.

Many of those states are now reviewing their regulations with new evidence indicating ground water impacts.<sup>64</sup> Lead is present in solder, flashing, and some old paints. Treated wood and old paints can also contain high quantities of other heavy metals such as chromium, copper, arsenic, mercury, barium, and cadmium. Drywall and plaster consist of gypsum which contains high levels of sulfate. Asphalt, roofing tar and tar paper contain leachable petroleum products. All of these are commonly found in C/D waste and have the potential to contaminate water supplies if not properly disposed of.

In properly sited, designed, and operated MSWLFs, C/D wastes likely do not pose a significant threat to ground water. However, the volume of this debris can be very large, taking up valuable space and shortening the life of the landfill.

Source reduction, or decreasing the amount of waste generated at construction sites, must be the highest priority method for waste management. This will depend on contractors examining their operational practices and implementing source reduction techniques.

Reusable materials, which generally have high value, can be separated and sold for small building, repair, or craft projects. Some communities have reuse centers where contractors bring usable construction materials. See, Chapter 7, p. 58 for more discussion on reuse centers.

There are processes for recycling asphalt and roofing shingles in both cold and hot paving mixes. Concrete, brick, glass, and tile have the potential to be used as aggregates in pavements. Metals are readily recyclable, but must be separated by type. Untreated wood can be ground for fuel, used to make mulch, chips, or compost.

The major barrier to the reuse and recycling of C/D wastes in Montana is the need for source separation. The profit margins are low, worker hours are valuable, and landfill costs are relatively cheap. Contractors cannot afford the time and money spent on source separation. In some states, complete C/D waste processing facilities are being built. These facilities accept mixed loads for a tipping fee slightly less than the nearest landfill, sort out the recyclables and reusables, and dispose of the rest. The economic viability of these facilities depends primarily on the tipping fees, but markets must also exist. The instability of markets for recyclables would be a major barrier in Montana. Chapter 8, page 66, discusses other barriers to recycling that waste managers should evaluate.

Contract managers should not overlook the possibility for writing bid specifications to encourage recycling. They can require or encourage the use of recycled materials in new construction.<sup>65</sup> Specifications could also require the designer of a facility to consider waste reduction during construction and ease of salvaging in the long run.

## RECOMMENDATIONS

**21. Provide education for architects, contractors, and builders on waste reduction and use of recycled materials.**

Source reduction will happen only when the builders and the designers make the commitment to examine their practices and make changes. This will require information and training opportunities. The SWM Program should work with professionals in the field to set up training opportunities.

**22. Encourage separation of reusable C/D wastes and encourage private salvage businesses.**

Tax incentives to recyclers were recommended in Chapter 8, page 69. These should be expanded to include builders who separate C/D wastes and salvage operations which keep C/D debris out of landfills. Communities should consider other kinds of incentives for these operations. The SWM Program should support legislation needed to give economic incentives to salvage operations.

## STRATEGY FOR CONSIDERATION

**Build reuse centers for C/D wastes.**

## CONTAMINATED SOILS

**Goal:** Contaminated soils will be handled in a manner that protects the public health and the environment.

### WHAT ARE CONTAMINATED SOILS AND WHY THIS GOAL?

When petroleum products, solvents or other toxic chemicals leak or are spilled onto soils, corrective action must be taken to prevent the migration of the contaminants to ground water or surface water. Sometimes these soils are determined to be hazardous and are regulated

under hazardous waste rules, but petroleum contaminated soils from underground storage tanks are not considered hazardous. When the corrective action plan involves the removal of the contaminated soils from the site rather than "in-situ treatment", and when the soils are not hazardous, they are considered solid waste. Waste managers must ensure environmentally-sound treatment and disposal. Ideally, these soils should be remediated until they meet cleanup standards and reused, rather than deposited in landfills.

In Montana, contaminated soils are typically landfarmed on-site or they are taken to a municipal solid waste landfill (MSWLF) or landfarm. MSWLFs may accept fuel-contaminated soils that do not test hazardous and bury it with other refuse. MSWLFs often landfarm soils prior to disposal, but these activities have been largely unregulated. In a landfarming process, the contaminated soils are spread thinly on the land surface in 6-12-inch lifts and occasionally tilled, allowing sunlight, air, and soil microorganisms the opportunity to break-down or evaporate the contaminants. Bioremediation of excavated contaminated soils by indigenous or introduced soil microorganisms may be effective if the environmental conditions and management practices can support microbial metabolism. Requirements for properly siting and operating a landfarm are available from the Montana Department of Health and Environmental Sciences.

Several other treatment processes for excavated petroleum-contaminated soil are available at varying cost, effectiveness, and environmental concern. In some states, the soils are processed at batch asphalt plants and incorporated into paving mixes. Thermal desorption, aeration, or mechanical techniques have been developed that remove the volatile organic compounds (VOCs) from the contaminated soil into a contained air space. The contaminated air stream may then be treated through carbon filtration, water scrubbers, or afterburners to reduce air emissions. Incineration, air venting systems, soil washing, biopile, and composting processes are also being further developed.

While treatment and disposal methods may provide greater protection than leaving the soils untreated on-site, they raise some environmental concerns. Depositing large amounts of petroleum-contaminated soil in a landfill takes up valuable space and introduces contaminants which may eventually leach from the landfill. Landfarming also releases VOCs into the air which may be of concern to surrounding residents.

## RECOMMENDATION

### **23. Adopt policies or rules for proper siting and operation of landfarms and establish clean-up standards.**

Although the Montana Department of Health and Environmental Sciences (MDHES) has rules for disposal of contaminated soils which test hazardous, they do not apply to non-hazardous contaminated soils. MDHES has guidelines for landfarming of non-hazardous contaminated



soils, but no final rule has been adopted. The rules need to establish clean-up standards so that waste managers know when remediation is complete and the soil can safely be used for another purpose such as landfill cover. The Solid Waste Management (SWM) Program should set up a task force with appropriate program personnel within MDHES and other knowledgeable persons to evaluate landfarming issues and recommend a plan of action. The task force should assist with rulemaking, discuss new technologies for treatment of contaminated soils, and recommend ways to further protect the public health from potential releases from contaminated soils. The SWM Program will proceed with rulemaking before the end of 1993.

## STRATEGY FOR CONSIDERATION

### Research and evaluate alternative treatment methodologies.

## ASBESTOS

**Goal:** Asbestos will be landfilled in a manner which protects the public health.

### WHAT IS ASBESTOS AND WHY THIS GOAL?

Since the early 1970s, the EPA and the Occupational Safety and Health Administration (OSHA) have been concerned about the potential health hazards relating to the generation, handling, and disposal of asbestos wastes. Over a period of many years following exposure, serious respiratory diseases and cancers can result from the inhalation of airborne (friable) asbestos fibers. The EPA provides the following description of asbestos.

Asbestos is the name for a group of naturally occurring minerals that separate into strong, very fine fibers. The fibers are heat-resistant and extremely durable, and, because of these qualities, asbestos has become very useful in construction and industry . . . Asbestos tends to break down into a dust of microscopic size fibers. Because of their size and shape, these tiny fibers remain suspended in the air for long periods of time and can easily penetrate body tissues after being inhaled.<sup>66</sup>

Asbestos is present in many materials in the home and workplace, but is only a health hazard when the materials can be crushed by hand pressure, when they are damaged in some way, or when the surface is not sealed. In these conditions the asbestos can become airborne and is considered "friable". Federal law requires friable asbestos to be removed from public



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54. Ibid.
55. 40 CFR Part 266, Subpart E.
56. Ibid.
57. EPA, "Standards for the Management of Used Oil", (40 CFR Part 279), *Federal Register*, Vol. 57, No. 176, Sept. 10, 1992.
58. EPA, *Summary of Markets for Scrap Tires*, Office of Solid Waste, Washington D.C., October 1991.
59. The Tire Retread Information Bureau, 900 Weldon Grove, Pacific Grove, CA 93950. Press Release, August 1992.
60. *Questions and Answers about Scrap Tire Management*, The Scrap Tire Management Council, 1400 K Street NW, Suite 900, Washington, D.C. 20005.
61. EPA, *Guide for Infectious Waste Management*, Office of Solid Waste, Washington, D.C., May 1986.
62. One good resource is Council of State Governments, *Model Guidelines for State Medical Waste Management*, Lexington KY, 1992.
63. Mark Federle, *Analysis of Building Construction Recycling Efforts in Iowa*, Iowa State University, 1992.
64. J. Connelly, L. Pugh and G. Mitchell, *Demolition Landfills--How Much Regulation is Needed?*, Wisconsin Department of Natural Resources, Madison, WI, 1991.
65. A Montana company, the Center for Resourceful Building Technology in Missoula is one of the leaders in the area of recycled building materials. Contact them at (406) 549-7678.
66. EPA, *Asbestos In the Home: A homeowner's Guide*, Region 8, Denver, April 1990.
67. EPA, *Integrated Version of Asbestos NESHAP*, Region V, Chicago, March 1991.



## CHAPTER 13. INDUSTRIAL WASTES

- Policy:** The State of Montana will plan for and implement an integrated approach to non-hazardous industrial solid waste management, based on the following order of priority: (1) source reduction; (2) reuse; (3) recycling; (4) composting; and (5) landfill disposal or incineration.
- Goal:** By 1996, the State of Montana will have reduced by at least 25%, the non-hazardous industrial waste that is disposed of by landfilling or incineration. The rate of reduction will steadily increase each year.

### WHAT IS INDUSTRIAL SOLID WASTE AND WHY THIS GOAL?



Industrial solid wastes are all non-hazardous wastes generated by industries and businesses. The Standard Industrial Codes (SIC) lists the following range of business activities:

SICs 01-09	Agriculture, Forestry & Fishing
SICs 10-14	Mining
SICs 15-17	Construction
SICs 20-39	Manufacturing
SICs 40-49	Transportation, Communication & Utilities
SICs 50-51	Wholesale Trade
SICs 52-59	Retail Trade
SICs 60-67	Finance, Insurance & Real Estate
SICs 70-89	Services
SICs 91-97	Public Administration

The wastes associated with activities with SICs above 50, generally go into the municipal waste stream and have been included in the discussion in the first 10 chapters of the plan. Construction and demolition wastes (SICs 15-17) also are generally part of municipal solid waste (MSW) and were discussed in Chapter 12.

The remaining industries--agriculture, forestry, fishing, mining, and manufacturing (including oil and gas production, utility coal combustion, cement production, and other manufacturing processes)--have not been discussed in this plan. The waste streams from these industries are extremely large and complex, and far beyond the scope of this plan.

Comprehensive waste stream data is not readily available for these industries in Montana. The U.S. Environmental Protection Agency (EPA) does not have nation-wide waste generation figures for agriculture and forestry. They estimate that mining and manufacturing wastes total 12.8 billion tons per year. This figure makes the 195 million tons of MSW seems like a drop in the bucket. In the whole universe of non-hazardous waste, industrial wastes make up 99% of the total and MSW makes up 1%.<sup>68</sup>

About 70% of that industrial "solid" waste is wastewater managed in surface impoundments on-site. Much of the remaining waste in more solid form is also managed on-site in landfills, landfarms, or waste piles. The extent of pollution control and monitoring at surface impoundments and other on-site disposal sites is unknown both in Montana and nation-wide. As of 1985, according to the Office of Technology Assessment, "many impoundments lacked sufficient design controls to prevent or detect contamination of the surrounding environment".<sup>69</sup>

Prior to October 1991, Montana law allowed persons to dispose of their own solid waste on their own land unless the land was a subdivision of fewer than 5 acres. "Persons" included businesses, industries, and any private or governmental entities. In 1991, the law changed to allow only persons whose waste is generated in "reasonable association with (their) household or agriculture operations," to dispose of their own waste on their own land.<sup>70</sup> In other words, businesses and industries are now required to either haul their wastes to a licensed site or license their own site.

The law specifically excludes certain industries from this requirement on the premise that they are regulated by other state agencies. These are electric generating facilities, operations related to the drilling, production, and refining of natural gas or petroleum, and the operation of a mine, mill, smelter, or electrolytic facilities. While various state agencies regulate portions of the waste stream of these industries, it appears that no one regulates the entire solid waste stream in a comprehensive manner. Regulating agencies usually consider only the dominant wastes such as hazardous materials, waste rock, fly ash, petroleum or other contaminated soils, metal slag, and spoils. Other solid wastes, such as low-volume, non-toxic wastes from operations, shops, or offices, may not be regulated.

## RECOMMENDATIONS

### **1. Develop an industrial solid waste management plan.**

In order to develop a comprehensive plan for industrial solid waste management, a more thorough study is needed. The Solid Waste Management (SWM) Program should commit the necessary resources to do additional research and meet with industry representatives and other state regulatory programs. Together they can identify the waste streams of particular



industries, the existing and potential integrated waste management processes available to Montana generators, and the resources and regulatory changes that may impact the implementation of integrated waste management programs. Only after such discussions and research can the SWM Program make industry-specific recommendations.

**2. Expand hazardous waste minimization and pollution prevention program to include solid waste.**

The Hazardous Waste Program of the Montana Department of Health and Environmental Sciences (MDHES) operates a waste minimization program designed to encourage industries to engage in source reduction, reuse, and recycling. The emphasis of the program, which consists of the equivalent of only one half-time employee, is preventing pollution from hazardous waste, although solid wastes are also considered. Inspectors identify potential waste minimization activities and encourage generators to adopt these practices. The state should apply more resources to the program. The SWM Program should devote increased staff time to industrial waste management, to work with the waste minimization and pollution prevention program and to expand this industrial waste chapter.

**3. Expand the industrial waste exchange.**

As one part of its hazardous waste minimization and pollution prevention program, the Hazardous Waste Program of MDHES contracts with the Montana Chamber of Commerce to operate an industrial waste exchange. A quarterly newsletter lists industrial wastes that businesses have available or would like to obtain. Other businesses, reading the newsletter, find materials they could use or sell. The program, which provides the service free, puts the businesses in contact with each other. The SWM Program should work with the Hazardous Waste Program to promote and expand the industrial waste exchange as a way to encourage integrated waste management.

**4. Increase the use of integrated waste management measures in enforcement settlements.**

When the SHWB determines that there has been a violation of environmental laws or regulations, it may seek an enforcement settlement prior to taking formal administrative or judicial action. These enforcement settlements may require violators to stop using a particular material, restore an ecologically significant area, educate the public, or implement a pollution prevention project. The SHWB should increase its use of source reduction, reuse, composting, and recycling as pollution prevention requirements in enforcement actions.

**5. Participate in regional and national efforts to examine the issues concerning industrial solid waste.**

The SWM Program should continue as an active member of EPA's national committee on industrial solid waste.

STRATEGY FOR CONSIDERATION

**1. Require reporting of non-hazardous industrial waste.**

In order to proceed effectively with promotion of waste reduction in industry, the SWM Program needs data on the amounts and types of waste being generated by various industries. The SWM Program should investigate reporting systems in other states, and discuss the need for such a system with representatives of the industries the would be affected if a reporting system were developed.

Endnotes

68 Comments of Jim Lounsbury, EPA in an October 1992 Teleconference produced by The Tennessee Center for Industrial Services.

69. U.S. Congress, Office of Technology Assessment, *Managing Industrial Solid Wastes From Manufacturing, Mining, Oil and Gas Production, and Utility Coal Combustion--Background Paper*, OTA-BP-O-82 (Washington, DC: Government Printing Office, February 1992)

70 Section 75-10-214, MCA

## **CHAPTER 14. PLANNING AND IMPLEMENTING INTEGRATED SYSTEMS**

Earlier chapters of this plan have discussed numerous recommendations and strategies for integrated waste management which local governments may wish to implement. This chapter provides a framework for implementing those suggestions and highlights some important components for communities. The framework is designed with rural communities in mind.

### **LOCAL GOVERNMENT FRAMEWORK FOR IMPLEMENTING AN INTEGRATED WASTE MANAGEMENT SYSTEM**

1. Set up a citizen's solid waste advisory committee.

Many local decision-makers have found that citizen's solid waste advisory committees are helpful in providing a forum for a variety of opinions, tapping into local expertise, generating community commitment, and organizing volunteer efforts. A balance of interests should be represented on the committee, such as local elected officials, municipal employees, community or neighborhood groups, landfill operators, waste haulers, recyclers, environmentalists, major waste producing industries, regulatory agencies, and citizens. If the planning area encompasses more than one municipality or county, geographic representation must also be considered. The committee's role should be clearly outlined, and local government may wish to provide official status and operational support (access to meeting space, staff time, telephones, office supplies, etc.). Subcommittees may help accomplish more specialized tasks.

2. Do an audit of the local waste stream.

Implementation of a local integrated waste management system depends on accurate waste generation and composition data, and an understanding of existing waste management systems and the primary sources of the waste. One of the first tasks of the citizens' advisory committee may be to oversee a waste audit that will give the community this information. The information will not only give a representation of the current situation, but will establish a foundation for projections. The committee must examine residential and commercial waste, industrial and agricultural waste, institutional waste, non-resident waste, seasonal variations, demographics, the state of the economy, etc. A waste audit may be conducted by calculating from existing data from similar areas, or by sorting, measuring and categorizing samples of the actual waste coming into local facilities. The Solid Waste Management (SWM) Program will provide waste audit information to communities.



3. Assess recommendations and strategies in the state plan and write a local integrated solid waste management plan.

The citizens' advisory committee should examine each recommendation and strategy discussed in this plan and determine its application to their community. Committee members should do additional research into those suggestions that seem appropriate to their communities. The citizens' advisory committee should then adopt portions of the state plan, or write their own local plan using a similar format.

4. Implement aggressive public education.

Integrated waste management efforts, particularly in rural areas, depend strongly on public education activities. The basic components of a public education program are described throughout this plan. They include distributing prepared literature and audio-visual materials, and making presentations to churches, schools, civic organizations, grange halls, business groups, and environmental groups. Integrated waste management information can best be promoted in rural communities by tapping into these existing lines of communication and by providing printed materials at community gathering points, retail locations, and waste disposal sites. Existing businesses, institutions, or clubs can be asked to sponsor workshops or demonstrations on various components of integrated waste management.

Communities with more resources should expand their educational programs to include workshops and seminars, multi-media campaigns, school curricula, hotlines, office waste reduction programs, shopper awareness programs, and demonstration projects. In addition to general consumer awareness of all components of an integrated waste management system, education can focus on specific waste reduction programs, and special waste problems. Suggestions are found throughout this plan.

5. Provide incentives for waste reduction.

The solid waste rate or fee structure in many areas does not provide an incentive for source reduction, reuse, and recycling. Communities should explore innovative ways to provide incentives for those who reduce their waste. In addition to economic incentives and disincentives, communities can offer awards programs and other public recognition programs to businesses or individuals that reduce their waste.

6. Target large industrial waste components.

If a dominant industry exists in the community, its cooperation should be sought in any integrated waste management program. A small community may be able to do more to efficiently reduce its waste stream by working with one industry, than with all its individual residents.



7. Explore cooperative agreements and structures.

Through cooperative efforts between neighboring communities, and private and public entities, communities can streamline administrative costs, increase the feasibility of processing recyclables, and reach more residents more efficiently through education programs. Regional processing facilities have good potential. Small communities may be able to coordinate recycling drives, taking advantage of higher volumes of materials and lower transportation costs. Communities may be able to share mobile balers, shredders, and crushers. Transportation and manufacturing industries can help ease barriers to recycling.

8. Build on existing programs.

Waste education groups and recyclers, either for-profit or not-for-profit, exist in many communities (see, Appendix D). By building on these existing programs, local governments can minimize capital costs and benefit from their expertise. Rural communities should consider using existing container sites, landfills, and transfer stations as the center of their new integrated waste management system.

### MODEL INTEGRATED SYSTEMS

The following models are suggestions, based on what has worked in some communities across the nation. Montana waste decision-makers will want to examine these models and adapt them to suit the specific needs of their communities.

#### For Towns and Rural Communities

In Montana, 49% of the population lives in communities of less than 1,000 people.

#### Major Components of a Model System:

1. community advisory committee
2. integrated waste management plan
3. basic public education
4. recycling drop-off bins with marketing to nearest buy-back center
5. drop-off for yard waste and windrow composting
6. roll-off waste containers for disposal

For Small Cities

In Montana, 11% of the people live in 39 cities with a population of 1,000 - 5,000.

Major Components of a Model System:

- 1-6 above as applicable
7. expanded public education
8. waste exchange, swap programs, yard sales, thrift stores
9. community recycling collection events
10. "buy-recycled" policy for local government
11. curbside collection of yard waste and windrow composting
12. rate structure incentives
13. Materials recovery facility/transfer station

For Mid-sized Cities

In Montana 8% of the people live in eight cities with a population of 5,000 - 20,000.

Major Components of a Model System:

- 1-13 above as applicable
14. reuse/repair center
15. collection programs for commercial sector recycling
16. curbside collection of yard waste and aerated static pile composting with sewage sludge and green wastes
17. environmentally sound landfill in the region

For Large Cities

In Montana, 32% of the people live in six cities with a population greater than 20,000.

Major Components of a Model System:

- 1-17 above as applicable
18. residential and commercial curbside collection of recyclables.

## **CHAPTER 15. SUMMARY OF RECOMMENDATIONS AND TIMELINES FOR ACTION**

All the recommendations, but not the additional strategies, contained within this plan are outlined below under the following headings:

- A. Recommendations Concerning Education
- B. Recommendations Concerning Economic Incentives/disincentives
- C. Recommendations Concerning Solid Waste Management (SWM) Program Review
- D. Recommendations Concerning New State Procedures
- E. Other Recommendations Requiring State Action
- F. Other Recommendations Requiring Local Action
- G. Other Recommendations Requiring Both State and Local Action

Each recommendation is listed only once, under the first heading to which it applies, even though it may logically fit under subsequent headings. The notation following each recommendation indicates the chapter, recommendation, and page numbers where the discussion can be found.

The "first steps" outlined below are those that must be taken by the Solid Waste Management (SWM) Program to begin implementation of the recommendation. Many steps must follow. Most recommendations will require a separate workplan. The "timeline" is the target date for completion of the first steps by the SWM Program. "Adoption" refers to the date of adoption of this plan by the Board of Health and Environmental Sciences. Local and Tribal governments will need to set their own recommendations and timelines.

First step: write a workplan for each recommendation  
Timeline: complete for all recommendations within one year of adoption

### **A. RECOMMENDATIONS CONCERNING EDUCATION**

- 1. Provide resources for local decision-makers on implications of 40 CFR Part 258.  
(3-2, page 35)**

First steps: complete draft rules; provide local waste managers with a detailed summary of the rules and ample opportunity to comment  
Timeline: complete within three months of adoption

2. **Increase the number of public education, recognition, and voluntary programs promoting each method in the integrated waste management hierarchy.** (5-1, page 45; 6-1, page 53; 7-1, page 60; 8-1, page 67; 9-1, page 76; 10-1, page 82; 11-1, page 87)

First steps: create information packets containing printed materials on each topic of the integrated waste management hierarchy; advertize their availability to waste managers and the public

Timeline: complete within six months of adoption

3. **Increase training opportunities for landfill operators and require certification.** (10-5, page 83)

First steps: renegotiate contract for landfill operator training; hold internal discussions on certification requirement

Timeline: complete within three months of adoption

4. **Expand educational programs for CESQGs and consumers and retailers of HHW to encourage source reduction, use of non-hazardous alternatives, reuse, and recycling.** (12-1, page 93)

First step: initiate discussion with MSU Extension Service to coordinate with existing programs in this area

Timeline: complete within three months of adoption

5. **Implement consumer education programs about batteries.** (12-7, page 96)

6. **Implement additional educational programs for DIY oil changers.** (12-9, page 98)

7. **Implement a public education campaign to extend the useful life of tires.** (12-11, page 101)

8. **Provide information to landfill operators and the public on the removal of refrigerants.** (12-15, page 104)

9. **Provide educational resources to infectious waste generators.** (12-18, page 106)

10. **Provide education for architects and builders on waste reduction and use of recycled materials.** (12-21, page 109)



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Each of numbers 5-10 preceding have similar first steps.

- First steps: explore available educational programs; consult with existing educational groups; select suitable program; make program information available to communities
- Timeline: complete for two recommendations within six months of adoption; for two more within nine months of adoption, and the final two within one year of adoption

**B. RECOMMENDATIONS CONCERNING ECONOMIC INCENTIVES/DISINCENTIVES**

- 1. Provide tax incentives for businesses which conduct certain waste reduction activities and for the development of end-use facilities for recyclable materials in Montana. (5-5, page 47)**

- First steps: discuss with Department of Revenue; publicize current 25% tax credit; consider legislation for extending or expanding the credit
- Timeline: do publicity within three months of adoption; consider draft legislation by August 1994

- 2. Provide economic incentives for source reduction. (6-2, page 54)**

- 3. Provide economic incentives for reuse. (7-5, page 60)**

- 4. Provide economic incentives for recycling. (8-5, page 69)**

Each of numbers 2-4 preceding have similar first steps.

- First step: research potential incentives available
- Timeline: complete within nine months of adoption

- 5. Provide grants or loans to communities to implement composting programs. (9-6, page 77)**

- 6. Provide grants or loan programs for local recycling efforts. (8-6, page 70)**

- 7. Implement an annual fee on retailers, distributors, or manufacturers who sell hazardous products. (12-5, page 95)**

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8. **Develop a program to process scrap tires by assessing a fee on tires either at the time of sale or vehicle registration. (12-13, page 102)**
9. **Fund a public education and collection program for white goods by assessing a tax on appliances at the time of sale. (12-17, page 104)**

Each of numbers 5-9 preceding have similar first steps.

First steps: explore potential funding mechanisms; consider legislation for 1995 legislative session

Timeline: complete by August 1994

10. **Support local micro-businesses that can use waste tires to manufacture products for local or regional markets. (12-14, page 102)**
11. **Encourage separation of reusable C/D wastes and encourage private salvage businesses. (12-22, page 109)**

Each of numbers 10 and 11 following have similar first steps.

First steps: make contact with businesses and potential businesses in the state; determine needs

Timeline: complete within one year of adoption

**C. RECOMMENDATIONS CONCERNING SWM PROGRAM REVIEW**

1. **Offer technical support to landfill manager in implementing ARM Title 16, Chapter 14, Subchapters 5 and 7. (3-1, page 34)**

First step: submit program approval application

Timeline: complete within one month of adoption

2. **Evaluate laws and regulations which may impede reuse. (7-6, page 60)**

First steps: ask for local input; examine current laws and regulations

Timeline: complete within nine months of adoption

3. **Examine current landfilling enforcement practices and pursue methods for increasing effectiveness.** (10-4, page 83, 132)

First step: seek input of all SWM Program and SHWB personnel  
Timeline: complete within one year of adoption

4. **Develop standardized, coordinated licensing and regulatory activities between the appropriate bureaus within the Montana Department of Health and Environmental Sciences (MDHES).** (11-4, page 88)

5. **Increase communication between MDHES regulatory programs that deal with asbestos management.** (12-24, page 112)

Each of numbers 4 and 5 preceding have similar first steps.

First steps: identify areas needing coordination; suggest changes  
Timeline: complete within nine months of adoption

#### D. RECOMMENDATIONS CONCERNING NEW STATE PROCEDURES

1. **Subject MSW that is imported into Montana to an additional, but reasonable, per-ton management fee.** (4-3, page 41)

First step: calculate reasonable, legally defensible fee  
Timeline: complete within three months of adoption

2. **Implement mechanisms to measure the 25% waste reduction goal.** (5-4, page 47)

First steps: research waste measurement activities in other states; draft recommendations;  
ask SWPAC members and others for comment  
Timeline: complete within three months of adoption

3. **Increase regulation of small incinerators operated by businesses and institutions.** (11-6, page 89)

First steps: justify the need; explore legislative options  
Timeline: complete by August 1994

- 4. Require that CESQGs notify landfill operators of hazardous waste disposal.**  
(12-6, page 95)

First step: discuss need and advisability with landfill operators and CESQGs  
Timeline: complete within one year of adoption

- 5. Adopt and implement the new federal standards for the management of used oil.**  
(12-8, page 98)

First step: adopt rules  
Timeline: complete within six months of adoption

- 6. Set compliance standards and implement a permit system for hospital incinerators.** (12-20, page 107)

First steps: discuss need with Air Quality Bureau; explore regulatory options  
Timeline: complete within one year of adoption

- 7. Adopt policies or rules for proper siting and operation of landfills and establish clean-up standards.** (12-23, page 110)

First step: prepare policies or draft rules for public input  
Timeline: complete within three months of adoption

- 8. Expand hazardous waste minimization and pollution prevention program to include solid waste.** (13-2, page 117)

First step: gather input from Hazardous Waste Program personnel and MSU Extension  
Timeline: complete within one year of adoption

- 9. Increase the use of integrated waste management measures in enforcement settlements.** (13-4, page 117)

First steps: gather input from Hazardous Waste Program personnel; explore policy options  
Timeline: complete within one year of adoption



**E. OTHER RECOMMENDATIONS REQUIRING STATE ACTION**

- 1. Join with major western markets to demand high quality products and packaging standards. (6-3, page 54)**

First steps: research existing coalitions; make contact  
Timeline: complete within six months of adoption

- 2. Concentrate state-wide recycling efforts on one or two products. (8-4, page 69)**

First steps: select an item for state-wide recycling; draft a plan for state-wide participation in the effort  
Timeline: complete within one year of adoption

- 3. Develop a comprehensive marketing strategy for compost. (9-4, page 77)**

First step: research marketing plans from other states;  
Timeline: complete within six months of adoption

- 4. Evaluate new technologies for landfill design and other alternatives. (10-6, page 83)**

- 5. Review economic and technology research on incineration. (11-3, page 88)**

Each of numbers 4 and 5 have similar first steps.

First step: assign SWM Program personnel to research alternatives and set up presentations for other staff  
Timeline: complete within six months of adoption

- 6. Establish a public/private partnership for state-wide collection and transfer of hazardous wastes from CESQGs and households. (12-4, page 94)**

First step: discuss project with private companies  
Timeline: complete within one year of adoption

7. **Assure compliance with the Montana Infectious Waste Management Act.** (12-19, page 106)

First step: discuss compliance procedures with medical associations and licensing boards  
Timeline: complete within six months of adoption

8. **Develop an industrial solid waste management plan.** (13-1, page 116)

First steps: assign program personnel to the task; begin discussions with affected industries  
Timeline: complete within one year of adoption

9. **Expand the industrial waste exchange.** (13-3, page 117)

First step: assess needs of an expanded program and funding options  
Timeline: complete within one year of adoption

#### F. OTHER RECOMMENDATIONS REQUIRING LOCAL ACTION

1. **Plan for regional systems.** (4-2, page 41)
2. **Develop local integrated waste management plans and achieve stable funding for their implementation.** (5-2, page 46)
3. **Establish community reuse areas and repair centers.** (7-2, page 58)
4. **Expand swap programs, yard sales, and thrift stores.** (7-3, page 59)
5. **Promote waste exchanges.** (7-4, page 59)
6. **Expand drop-off centers, community collection events, and commercial collection.** (8-3, page 68)
7. **Encourage/implement more backyard composting.** (9-2, page 76)
8. **Implement windrow composting operations of yard waste.** (9-3, page 76)
9. **Encourage community collection events and waste exchanges.** (12-2, page 93)

**10. Encourage repair and reuse of white goods. (12-16, page 104)**

The preceding recommendations depend on action by the local solid waste decision-makers. The SWM Program's role in all recommendation numbers 1-10, is to provide information, train its personnel in the issues, and encourage implementation by local waste managers.

First steps: develop information packets for each recommendation; provide them to local waste managers

Timeline: complete packets for five recommendations within one year of adoption;  
complete remaining packets within two years of adoption

**G. OTHER RECOMMENDATIONS REQUIRING BOTH STATE AND LOCAL ACTION**

The following recommendations depend on action by both state and local solid waste decision-makers. The first steps and timelines, however, apply only to the SWM Program's role. Local waste managers will need to set their own goals and timelines.

**1. Require all solid waste facilities (landfills, incinerators, recycling centers, and composting facilities) to record and report accurate data on existing landfill capacity, disposal rates, recycling rates, and on waste reduction rates. (4-1, page 40)**

First step: set up process for getting input from waste managers on this issue

Timeline: complete within six months of adoption

**2. Increase public participation in solid waste decision-making. (5-3, page 47)**

First step: provide copies of the final plan to interested citizens and local libraries

Timeline: complete within one month of adoption

**3. Provide increased technical assistance to institutional and commercial establishments. (5-6, page 48)**

First steps: collect business-specific examples of integrated waste management activities; supply these to business associations and local waste managers; coordinate with MSU Extension

Timeline: complete for three businesses within one year of adoption; complete for three additional business in each succeeding year until the project is complete

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**4. Increase government participation in integrated waste management activities. (5-7, page 48)**

First step: expand technical assistance to state government recycling programs; include more locations and commodities  
Timeline: complete within one year of adoption

**5. Increase purchasing of recycled products and materials. (8-2, page 68)**

First step: implement a state government "buy-recycled" program  
Timeline: complete within six months of adoption

**6. Implement/encourage private/industrial composting operations. (9-5, page 77)**

First steps: select one industry suited for composting operations; develop plans for a model operation  
Timeline: complete within one year of adoption

**7. Increase communication between state and local solid waste officials. (10-3, page 83)**

First step: establish a committee to listen to local government concerns  
Timeline: complete within three months of adoption

**8. Evaluate other priority waste management methods in the application process for new landfill licenses. (10-2, page 82)**

**9. Consider the entire waste management hierarchy before choosing incineration. (11-2, page 88)**

**10. Divert toxic and recyclable materials prior to commercial incineration. (11-5, page 88)**

Each of numbers 7-9 preceding have similar first steps.

First step: develop questions for local waste managers to consider in the application process  
Timeline: complete within six months of adoption



**11. Establish model demonstration sites and a "green seal of approval" program for CESQGs. (12-3, page 94)**

First step: discuss program with MSU Extension Service  
Timeline: complete within six months of adoption

**12. Expand the collection system for DIYs' used oil. (12-10, page 99)**

First steps: evaluate Department of Administration Surplus and Supply program for DIY oil collection; discuss need for expansion  
Timeline: complete within six months of adoption

**13. Encourage government use of retread tires. (12-12, page 101)**

First steps: provide information to Department of Transportation; discuss use of retreads  
Timeline: complete within one year of adoption

**14. Improve landfill operator safety in asbestos disposal. (12-25, page 112, 113)**

First step: evaluate need for safety training with MDHES Occupational Health Bureau, landfill operators and MACo  
Timeline: complete within six months of adoption

**15. Segregate asbestos into specified areas in the landfill. (12-26, page 112, 113)**

First step: Discuss in-house the advisability and implications of requirement  
Timeline: complete within six months of adoption



## **CHAPTER 16. COMMENTS ON THE DRAFT PLAN**

About 65 pages of comments were received in response to the draft plan. All these comments were carefully read and reviewed. After the review, it was determined the best way to respond to the comments was to consolidate and summarize them to eliminate redundancy and irrelevance. In some cases, the comments were paraphrased, and where two or more commentators made similar points, they were merged into one comment. Thus, although a comment may not appear here in exactly the same form it was made, the substance of the comment is found in the following text, along with a response to the issues it raised. The comments have led to various changes in the text of the draft plan. The changes have been incorporated into this document, which is the proposed final of the State of Montana Integrated Solid Waste Management Plan.

About 300 copies of the draft plan were mailed out to Montana public and university libraries, County Commissions and governing bodies of all incorporated cities, and other individuals directly involved in the management of solid waste. The public comment period opened August 9, 1993 and closed November 9, 1993. Public hearings, designed to take oral comments, were held in Helena on September 21, 1993, in Missoula on September 23, 1993, and in Billings on September 28, 1993. The parties responding with comments are shown in the text below.

### **RESPONDENTS TO THE DRAFT PLAN**

Oral comments made at the public hearings were given in Missoula by Shannon McNew and in Billings by Drury Phebus, Ken Haag, and Jim Gallup. No oral comments were offered at the public hearing held in Helena.

Written comments were received from the following:

Peter Neumann	Vicki Hyatt
Harry Watkins	Kristee Lang
Roger Tippy	W.E. Stevens
N.E. Vosburg	Timothy Feeley
Erling Tufte	John L. Olson
Stephen Smith	Peg Likens
Bill Price	John W. Ray
James Woehler	Roger Sicz
Rich Perry	R. Stephen Browning
Billings Public Works staff	

The comments are given below and are structured into general ones and those making points on issues in specific chapters of the text. Comments are shown with a "C" and the responses are shown with an "R".

#### GENERAL COMMENTS

C. The policies and recommendations in the plan should be mandatory directives rather than voluntary suggestions, and the state should have the authority to implement and enforce and regulate them.

R. The plan was not envisioned by lawmakers to be mandatory because of the potential of placing an unmanageable burden on individuals, local and tribal governments, or private enterprise. The Integrated Waste Management Act (IWMA) does not give the Department the authority to require compliance with the plan.

C. The plan doesn't have enough teeth in it; it should be stronger.

R. The plan was designed to be a broad policy document. The goals and recommendations are offered as models or ideals for effectively reinforcing the given policies. The Solid Waste Plan Advisory Committee agreed the plan should be a more general document that wouldn't provide a blueprint for each community's needs, but would allow individuals, communities, or groups to select specific goals or recommendations to fit their particular needs.

C. The plan relies too much on an expensive and unfocused program of public education, grants, and broad studies.

R. The plan provides a full complement of balanced ideas given the various audiences and individual components of the waste management hierarchy. It is required by law to include a segment on education and public information. The recommendations encompass waste audits, collection events, purchasing options, economic incentives, as well as policies, practices, and procedures for implementation at the state or local level.

C. I'm disappointed in some of the recommendations because they're too general and don't provide enough follow-up.

R. The recommendations establish a middle ground of providing general guidance without setting narrow constraints. In Chapter 15, each recommendation is provided with the first steps needed to undertake the recommendations. The SWM program will prepare an outline of additional actions that are necessary, enlist participation of key players, and provide stability and central coordination.



C. It's appropriate in the state plan to talk about what we'd like Congress to do, along with what we can do at our level.

R. The plan is designed to serve as a framework for Montana's state and local jurisdictions regarding solid waste management. It stops short of singling out national policies and legislation because it would be difficult to achieve a consensus regarding the hopes and ideals for integrated management of solid waste at the federal level.

C. It appears communities are being left to deal with the planning, financing, and implementation issues of municipal solid waste. Where will communities find the funds to undertake these activities?

R. The Solid Waste Management Act (SWMA) identifies that local governments hold primary responsibility for managing their solid wastes. The plan takes into account the scarcity of local funds for conducting integrated waste measures. Requirements are not placed on communities; however, local governments are extended an invitation to participate. Many of the recommendations are cost-efficient in the long term. Others are designed to minimize costs and maximize the benefits to be accrued. Communities are also encouraged to build on resources and programs that are already in place.

C. We would have no objection to implementing parts of the plan, if they are not created as unfunded mandates. If the state believes integrated waste measures are a priority, it should provide funding to cover local government costs of implementation.

R. The plan recommends that stable funding be established for the implementation of community waste management measures. The SWM program is exploring mechanisms, such as tax incentives and legislation for a grant program, that will help defray the costs of undertaking such activities. However, tax incentives and grants can be transitory. As a result, more stable local funding is preferred.

C. The plan recognizes the difference between solid waste and recycling materials, but this distinction could be made more clear.

R. The basis for the text's discussion of recycling and solid waste disposal is EPA's use of the two concepts. However, to further distinguish between two terms, we have expanded the text in Chapter 2 to include clarifying statements about solid waste disposal and recycling (see, p. 21 and p. 23).

C. Very few people knew about the public hearings; there should have been more advertising.

R. In September, 1993, DHES conducted three public hearings: in Helena, Missoula, and Billings. They were promoted, along with the public comment period, in two news releases that were sent to Montana's weekly and daily newspapers. In addition, each hearing was

publicized through an advertisement placed in one or two daily newspapers prevalent in the area.

## CHAPTER 1. INTRODUCTION

C. Since it was not the intent of the IWMA for the plan to set policy, I suggest the following sentence be changed - "The plan sets policy and provides guidance for the State of Montana".

R. The IWMA implies the plan's purpose is to provide policy at the state level. The Act says it is the policy of the state to plan and implement an integrated approach to solid waste management. It also states "that as a basis for developing an integrated waste management program . . . the department [MDHES] shall prepare and implement a state solid waste management plan. . . ." The text has been modified to read "The plan suggests policy and provides guidance. . .". (See, p. 8.)

C. Under the role of the private sector, the narrative says that "local governments will always be around for the long-term care and attention to the impacts of waste facilities". We all know that local governments like private companies may not be here. I suggest this comment be removed.

R. The comment has been removed from the text.

C. The text about the private sector's role doesn't reflect that experience shows that local governments can often achieve significant cost savings while providing greater service through privatization of solid waste systems.

R. A variety of perspectives exist regarding the benefits and drawbacks of public vs. private management of solid waste. The plan identifies that contracting with the private sector for appropriate activities is encouraged by the SWMA. The narrative underscores that local governments retain the overall responsibility, gives the advantages and disadvantages for public vs. private management, and suggests officials talk with leaders from other communities when making these decisions.

## CHAPTER 2. SOLID WASTE MANAGEMENT IN MONTANA

C. On page 22, the section on disposal facility data should be updated.

R. The statistics have been brought up-to-date to reflect Montana's waste disposal situation as of late December 1993.

### CHAPTER 3. SUBTITLE D REGULATIONS

*\*NOTE: The writing of the draft plan was completed in mid-1993; at that time the content of Chapter 3 was reflective of the status of EPA's Subtitle D Regulations. The passage of the October 1993 amendments to Subtitle D offered an extension in several deadlines and a change in ground water monitoring. The text in Chapter 3 has been updated to reflect the October 1993 amendments as well as attainment of partial approval from EPA of Montana's regulatory program.*

C. Under operation criteria, it should be clarified that Subtitle D requires random inspection of incoming loads unless the owner or operator takes other steps to insure that incoming loads do not contain regulated hazardous waste or PCB waste.

R. The text has been revised accordingly.

C. Under design criteria, a reference to geosynthetic clay liners, which provide promise to facilities where clay soils are unsuitable, should be mentioned as an alternative design based on performance standards.

R. The text has been revised accordingly.

C. Under ground water monitoring, the discussion should reflect that a corrective action program is required when any of the constituents have been detected at a statistically significant level exceeding ground water protection standards.

R. The text has been revised accordingly.

C. The sections on ground water and small landfill exemptions should be revised appropriately to reflect that, as a result of the Sierra Club/EPA decision, small landfills must comply with ground water criteria.

R. The text has been revised to reflect the fact that all municipal landfills are now required to conduct ground water monitoring.

### CHAPTER 4. LANDFILL CAPACITY AND REGIONALIZATION

C. The plan should require monitoring and reporting of volumes of waste that are recycled and landfilled.

R. All licensed solid waste management facilities are presently required to make a yearly report on the amount of solid waste received and disposed of. One of the recommendations is for recycling centers and compost operations to record and report accurate data on recycling



and waste reduction rates. The SWM program will encourage municipal landfills to have weight scales or help them establish another means of accurately estimating the waste they process.

C. The report says accepting other states' wastes will increase the negative impact and that it will also discourage recycling in the state where the waste originates. Neither of these statements are necessarily true.

R. Montanans hold a variety of opinions regarding the importation of wastes into the state, with the positive and negative effects being the center of controversy. The text has been changed to read "Accepting waste from other states increases the potential for Montana's natural resources, as well as its citizens, to be impacted. Solid waste disposal unavoidably causes some environmental, social and economic impact, both beneficial and harmful. It also has the potential to discourage recycling in the state where the waste originates." (Sec. p. 38.)

C. Fees on solid waste importation should be set and collected within the localities where the solid waste facilities are to be located. Fees should not go into the state general fund and should be used to mitigate impacts in the affected areas.

R. By law, the fees on imported solid waste are to be deposited in the state's special revenue fund for administering and implementing an imported solid waste management program by MDHES.

C. Do we really need to create a method in which to measure the state's ratio of recycling vs. refuse sent to landfills? This is an enormous task that will undoubtedly be inaccurate.

R. Data on recycling is needed to respond to the IWMA's 25% waste reduction goal and for establishing waste management policies. Montana-specific statistics are a key in attracting new recycling industries and expanding the existing ones. The SWM program, along with businesses and groups, will review the need for measurement and establish, if appropriate, reporting methods that are fair, reliable, and confidential.

C. Recommendation #1 requires municipal landfills to record and report accurate data. It's appropriate for them to report on their existing capacity and disposal rates, but recycling and waste reduction may not be factors which are available to them or under their control. Recycling and waste reduction rates should be reportable by communities.

R. The SWM program will develop and manage a data collection system for use in monitoring the state's solid waste stream. This means gathering data from the public and private sectors, including recyclers, waste disposal facilities, and other groups conducting waste reduction activities. Since recycling systems may vary from location to location, it is expected that reporting systems will vary. A reporting system will be developed that all parties can use.



CHAPTER 5. INTEGRATED WASTE MANAGEMENT

C. The public education goals are great, but who is going to pull the whole strategy together? Local governments need technical help and a little leeway to work toward environmentally sound waste management options. Proper guidance from the SWM program will be critical for success.

R. The integrated solid waste management plan will not be effective unless its recommendations are implemented at the local level. The SWM program will provide support and coordination as communities undertake waste saving measures. The SWM program will provide technical assistance, materials, educational opportunities, and training on source reduction, reuse, recycling, and composting.

C. Communities should be given a marker or credit for present waste reduction programs, that could be applied toward the 25% waste reduction goal.

R. A survey of waste management projects and groups will be conducted and this data will also be used as a measure of movement toward the 25% reduction goal. It should be stressed that the 25% goal is not a mandate. There are no penalties if it is not reached. However, the SWM Program hopes that it can be met and exceeded in Montana.

C. How do we know when we hit the waste reduction goal of 25%, if the various efforts are not being measured?

R. Until the system for collecting data from recycling and source reduction centers is in place, SWM program officials will use the 1991 waste disposal total as a baseline figure and compare this number with disposal data reported each year by landfills, compost facilities, and incinerators, as well as recycling data collected.

C. The plan should support an extensive public education program about reduction, reuse, and recycling by providing personnel as resources and money for funding.

R. Public education is an underlying theme throughout the plan. Chapters 5 through 13 contain various goals and recommendations which when taken as a whole constitute a broad-based public education program. Some of the recommendations are a) SWM program support of a state-wide media campaign, b) the increase of materials and technical assistance available from the program, c) the creation of model community projects, d) the provision of tax incentives for reuse and recycling, and e) funding support for source reduction and recycling grants.

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C. The recommendation to 'provide tax incentives for businesses which conduct certain waste reduction activities' should be expanded to say also the development of end-use facilities for recyclable materials in Montana.

R. The text has been revised, and the recommendation now includes offering tax incentives for the development of end-use facilities (see, p. 47).

C. I think individuals should make waste reduction a personal goal.

R. The plan identifies the state's policy will be to promote source reduction as the most important management method and to foster the reuse and recycling of products and materials as preferred methods over landfilling and incineration. Among the goals presented are the intentions that every community will have source reduction, reuse and recycling programs. Individual effort will be required for any waste management method to be completely successful.

CHAPTER 6. SOURCE REDUCTION

C. The plan includes a strategy that suggests enacting taxes or fees on certain items or materials. There is no evidence that taxes imposed on items which are hard to dispose of or which have costly environmental impacts are effective.

R. The text cites both the advantages and disadvantages of using taxes and fees as a tool for encouraging less packaging. Since the facts are inconclusive about whether fees on products are successful in reducing the amount of waste produced, the idea is put forth merely as a strategy for communities to consider.

CHAPTER 7. REUSE

C. I'm concerned about the recommendation of deposit legislation for beverage containers. Such a law would amount to a tax on the soft drink and beer industry.

R. The plan discusses refillable containers and reusable packaging as a potential waste management option available to Montanans. It does not recommend deposit legislation, but offers as a strategy for consideration the idea of increasing the use of refillable containers as one tool among many for communities to look at. (See, the following response below.)

C. We urge removal of the strategy for consideration 'Increase the use of refillable containers and other reusable packaging' from the plan. The assumption that reusable food and beverage packaging is environmentally superior is unproven and questionable from a public health perspective.

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R. Under the IWMA, the plan is required to be thorough and comprehensive. The inclusion of refillable containers and reusable packaging as potential waste management strategies was discussed at length by the Solid Waste Plan Advisory Committee. Such measures have been successfully instituted in various places and are worthy of discussion in Montana; at the same time, Montanans hold a wide range of opinions about the reuse of such items. The strategy has been revised to read "Increase the use of reusable packaging and explore the issues and feasibility of increasing the use of refillable containers". (See, p. 60.)

C. The plan should support a bottle bill and establish a state tax or surcharge on products, packaging and disposal methods that contribute heavily to the waste stream.

R. In terms of waste reduction, the reuse of containers and packaging is a viable concept. However, the facts about the costs and benefits of instituting such measures in Montana are inconclusive, so the concepts are presented as strategies for consideration.

C. The plan should include financial incentives for businesses producing or using reusable packaging.

R. Policy options are being considered on the national level which would provide inducements for businesses that produce or use packaging to use reusable materials. The Department will continue to explore incentives for reusable packaging, and as incentives are developed on the national scene, will look at the potential for legislation.

C. Under the discussion of refillable containers, the German purchase system is apparently referred to. The 'German solution' system has proved to be a bust, and is objected to by consumers, distributors and retailers alike.

R. The text has been expanded to include the statement "However, such a program instituted in Germany presently has logistical, financial, and material surplus problems due to the accelerated phase-in of high recovery rates which have outpaced markets and end uses". (See, p. 61.)

C. We're concerned that a review process be followed before the adoption of the recommendations in Chapter 7 regarding swap and reuse programs. To encourage the transfer of a possible hazardous waste from one party to the next for use may generate liability for the city.

R. Reuse measures include swap programs for durable goods, bulletin board lists of waste exchanges, and collection events for household items. Communities will not acquire the regulatory status of hazardous waste generator from wastes taken in through household hazardous waste (HHW) collection programs, regardless of the amount accumulated, if the materials are from a) household sources and b) businesses that are conditionally exempt, providing the waste is disposed legally. However, communities or groups sponsoring or organizing the HHW event are responsible for proper documentation of incoming wastes and proper storage, treatment, and disposal of the collected material. Local procedures should be



established to register such activities. The SWM program has prepared a guidebook on HHW collection programs. The text has been revised to include the above information. (See, p. 58.)

## CHAPTER 8. RECYCLING

C. One mistake made by the governments around the country has been the development of recycling programs for products that have no markets. We would do well to ensure that our program doesn't incorporate a product without a viable market already existing.

R. The plan recommends that recycling be concentrated on one or two products, such as those with stable markets or that are large waste contributors. Collection efforts should focus on products with strong markets. At the same time, local markets and end uses should be found for products generating large amounts of waste. The text has been modified to strengthen the emphasis on collection programs for products with viable markets (see, p. 69).

C. To stimulate recycling in rural areas, the state may need to play an active role.

R. The SWM program will help communities establish recycling programs, provide education and training on recycling issues and technologies, offer information on buying recycled, and see that increased collection is accomplished for several commodities.

C. There appears to be no strategy in the plan to enhance markets for recyclables. It should identify that manufacturing processes are a key to markets, along with incentive programs. State government should not begin to interfere in the marketplace.

R. Recycling in Montana is impacted by distant markets, little manufacturing, weak prices, and high transportation costs. The recommendations offer a realistic approach to market development, given the state's situation. The plan proposes to a) increase educational programs, b) expand the purchasing of recycled products, c) establish more drop-off centers, collection events, and commercial collection programs, d) focus on the widespread collection of one or two products, and e) offer economic incentives, including financial assistance for recycling.

C. The viability of markets for recyclable materials hinges on the continued availability of those materials. We would recommend that the state institute a limitation on local bans of certain types of packaging.

R. There are conflicting opinions about how--as waste management practices--source reduction, reuse, and recycling should complement each other. Many individuals believe the first consideration is to stop waste before it starts. In this view, reuse of an item once its generated is second in importance, with recycling being third in importance, because it takes



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resources to convert an item into a new product. Others feel source reduction and reuse hinder the development of recycling markets. With such divergent perspectives, the decision to place a limitation on the banning of materials should be left to the federal government.

C. Market forces provide a greater impact on recycling levels than bottle deposits. The focus of solid waste planning should be on markets rather than deposits.

R. As the plan illustrates, the state's focus is on an integrated approach to solid waste. The objectives are to conserve resources, increase participation in waste issues, and create jobs in waste-related fields. This will be a balancing act involving a combination of waste planning methods. Such methods will utilize a) the cost and efficiency of source reduction and reuse, b) markets for recyclables, c) end-uses for compost and other wastes, and d) landfill disposal for wastes that aren't handled effectively through other means.

C. Recycling is recycling, whether pre- or post-consumer. If material that would have otherwise been disposed of is reused or reprocessed, the pre- or post-designation is irrelevant. It's definition should not be limited to post-consumer waste.

R. There is much debate about whether "recycled" includes pre-consumer scrap produced during the manufacture of an end product. As of yet, no official nationwide standards exist for defining the term "recycled". In waste reduction the distinction between pre- and post-consumer is important. Manufacturers typically use pre-consumer scrap to make new products, but the waste that often has not been used is post-consumer. Post-consumer content is an indicator for buying recycled products to ensure a market demand is created for items that have been used and discarded by consumers. In the plan, "recycling" applies to a material that has served its final intended purpose, has been used and thrown away by consumers, and is headed for a landfill. However, the SWM Program recognizes that the reuse of pre-consumer scrap also has ramifications on the recovery of resources.

C. The fact that recycling in Montana is hindered by low volumes of recyclables, long distances to markets, and lack of financial resources points out the problems with outright dismissal of inter-state solid waste solutions.

R. In Chapter 4, the discussion recognizes the value of developing effective regional solid waste systems 'within the state'. The focal point has been in-state because the charge for the plan is to provide guidance for the role of government, private business, and citizens in Montana. Montana is participating in several multi-state groups, including the Mid-Continent Recycling Association, Northwest Recycling Forum, Western States Recycling Coalition, and Western States Contracting Alliance with the hope of developing regional systems and cooperation in recycling.

CHAPTER 10. LANDFILLING

C. In the chapter on landfilling, the acceptance of hazardous waste is discouraged, yet no alternative is offered. This may lead to hazardous wastes entering the system in a disguised form.

R. The state has requirements for monitoring regulated hazardous wastes and polychlorinated biphenyls (PCB) waste to prevent their disposal in municipal landfills. Operators of municipal landfills must screen their waste for regulated hazardous and PCB wastes.

A goal for lessening the volume of hazardous waste that is landfilled was added to Chapter 10. Such a goal is consistent with the discussion in Chapter 10 as it promotes environmentally sound landfills. A supporting discussion has been added to the text in that chapter (see, p. 79 and p. 81).

C. Since Montana relies heavily on landfilling, cost effective recommendations promoting environmental protection should be developed to build public acceptance of landfilling as a positive strategy, rather than the negative focus currently presented.

R. The recommendations in Chapter 10 are designed to positively effect public perception. The SWM program will evaluate new technologies and pass along the information to decision-makers, provide training to landfill operators to increase their expertise, and disseminate information intended to raise public understanding of the changes occurring in landfill practices. The SWM program will also take a look at present enforcement practices and refine them to increase their effectiveness.

C. To prevent environmental problems as well as to lessen our reliance on landfills the following should be done: a) landfills should be designed for zero discharge of leachate, b) stringent ground water monitoring rules should be adopted by state agencies, c) mandatory penalties should be established for ground water pollution from landfills, d) monitoring of old, closed dumps for ground water contamination should be required, e) an abandoned landfill clean-up fund should be established for reclamation of leaking landfills, f) communities applying for a new landfill permit should be required to first evaluate source reduction and recycling options, g) landfills should be required to locate recycling, composting and HHW centers on or next to their site, h) a fund for assisting local integrated waste management projects should be established, i) tax incentives should be provided for mining old landfills, and j) the permitting process should be streamlined for composting, recycling and HHW disposal.

R. Several of the above suggestions are already occurring to one degree or another. a) Under the new state regulations, Montana landfills are required to be designed with liner and leachate collection systems. Also, leachate must be controlled and treated, and stringent ground water monitoring rules and penalties for contamination have already been adopted. b) The permitting process for composting, recycling, and HHW disposal has been simplified to

facilitate the development of these types of waste management methods. Communities are urged to evaluate waste reduction and recycling options. Local governments are encouraged to reduce their landfill costs by establishing recycling and composting centers. By implementing these operations, officials have the ability to decrease the volume-based waste fee that their landfill is subject to. c) The solid waste plan includes a specific recommendation for the stable funding of local integrated waste programs. d) Some of the items suggested above are complex and expensive issues that will be examined down the road, such as the monitoring of old, closed dumps, the creation of landfill clean-up funds, and tax incentives for mining old landfills.

## CHAPTER 11. INCINERATION

C. I have a reservation with the priority of measures that places incineration after landfilling. This seems to be based on unsupported and undocumented concerns about environmental impacts of constructing solid waste incinerators. I feel incineration with the proper environmental controls is probably preferable to landfilling of raw waste.

R. The IWMA lists a pyramid of options that places landfilling and incineration as the lowest priority methods for solid waste management. There is considerable controversy about the environmental soundness of incineration. For that reason, the plan recommends other management options be considered first. The SWM program will continue to review new technological and economic developments on incineration and provide information about its strengths and weaknesses, so individuals can make informed decisions about the siting and use of incinerators.

## CHAPTER 12. SPECIAL WASTES

C. The plan talks about household hazardous wastes (HHW) and that produced by small quantity generators, but doesn't talk about larger quantities.

R. The plan focuses on the requirements of the IWMA, which calls for a plan relating to solid waste, as well as HHW and special wastes. Hazardous waste produced by small quantity generators is considered a special waste. State and federal laws regulate hazardous wastes, but wastes from households and small generators are exempt from the stringent standards of hazardous waste disposal.

C. The plan seems to place additional requirements on local governments regarding "special wastes". For example, it requires every community to have a used oil collection system. There should be statewide programs for special wastes; local governments shouldn't be saddled with the responsibility of executing such programs.



R. Programs for special (or problem) wastes need to be tailored to the particular situation of each community. The SWM program will provide assistance by 1) helping with the creation of local waste reduction and collection programs, 2) conducting public education about batteries, infectious waste, construction and demolition material, used oil, and refrigerant removal, and 3) exploring sources of financial assistance and economic incentives.

### CHAPTER 13. INDUSTRIAL WASTES

C. The plan should provide recommendations for the regulation of non-municipal solid waste from mining, forestry, coal, and petroleum industries; support the adoption of a toxic waste program; and promote alternatives for chemical pesticides and herbicides.

R. The plan contains recommendations for industrial solid wastes, which are non-hazardous wastes from industries and businesses. However, the wastes from industries such as agriculture, forestry, mining, and production of natural gas, petroleum, coal, and cement are large, complex, and often contain hazardous components. These waste streams are beyond the scope of this plan. Regulations have been adopted for the management of toxic and hazardous wastes, including generators of large quantities of pesticides and herbicides. Except for industries exempted from compliance with the SWMA, industrial waste which is non-inert with little potential of damaging the environment must meet the same standards as municipal solid waste for disposal.

### CHAPTER 14. PLANNING AND IMPLEMENTING INTEGRATED SYSTEMS

C. The plan treats large communities different than small communities, by asking them to undertake additional waste management practices for a model program. I feel the requirements should be the same for all citizens regardless of where they live.

R. Suggestions are offered for local waste management activities; these are not requirements, but are measures common to exemplary programs. Six activities are outlined as keys to a vigorous program regardless of the size of the community. They're designed with the capabilities of rural communities in mind. Larger communities are more likely to have the resources and the motivation to provide more extensive services. The additional activities are presented as ideas for their consideration.



## APPENDIX A

### THE INTEGRATED WASTE MANAGEMENT ACT

**75-10-801. Short title.** This part may be cited as the "Montana Integrated Waste Management Act".

**75-10-802. Definitions.** As used in this part, the following definitions apply:

(1) "Composting" means the controlled biological decomposition of organic matter into humus.

(2) "Department" means the department of health and environmental sciences provided for in 2-15-2101.

(3) "Integrated waste management" means the coordinated use of a priority of waste management methods, including waste prevention, as specified in 75-10-804.

(4) "Postconsumer material" means only those paper products generated by a consumer that have served their intended end uses and have been separated or diverted from the solid waste stream.

(5) "Recycling" means all activities involving the collection of recyclable material, including but not limited to glass, paper, or plastic; the processing of recyclables to prepare them for resale; the marketing of recovered material for use in the manufacture of similar or different products; and the purchase of products containing recycled material.

(6) "Special waste" means solid waste that has unique handling, transportation, or disposal requirements to ensure protection of the public health, safety, and welfare and the environment.

(7) "Waste reduction" means practices that decrease the weight, volume, or toxicity of material entering the solid waste management stream after consumer or commercial use but prior to incineration or disposal.

**75-10-803. Solid waste reduction target.** It is the goal of the state, by January 1, 1996, to reduce by at least 25% the volume of solid waste that is either disposed of in a landfill or incinerated.

**75-10-804. Integrated waste management priorities.** It is the policy of the state to plan for and implement an integrated approach to solid waste management, which must be based upon the following order of priority:

- (1) reduction of waste generated at the source;
- (2) reuse of waste;
- (3) recycling of waste;
- (4) composting of biodegradable waste; and
- (5) landfill disposal or incineration.

**75-10-805. State government source reduction and recycling program.** (1) In order to progress toward achieving the waste reduction target identified in 75-10-803, each state agency, the legislature, and the university system shall:

(a) prepare a source reduction and recycling plan by January 1, 1992, to reduce the solid waste generated by state government. This plan must be submitted to the department and must include, at a minimum, provisions for the composting of yard wastes and the recycling of office and computer paper, cardboard, used motor oil, and other materials produced by the state for which recycling markets exist or may be developed.

(b) establish and implement a source reduction and recycling program by July 1, 1992; and

(c) apply computer technology to reduce the generation of waste paper through:

(i) the use of electronic bulletin boards;

(ii) the transfer of information in electronic rather than paper form; and

(iii) other applications of computer technology.

(2) The plan must be evaluated every 5 years and updated as necessary.

**75-10-806. State government procurement of recycled supplies and materials.** (1) The department of administration shall write purchasing specifications that incorporate requirements for the purchase of materials and supplies made from recycled materials if the use is technologically practical and reasonably cost-effective. By January 1, 1992, these requirements must be incorporated into the purchase of:

(a) paper and paper products;

(b) plastic and plastic products;

(c) glass and glass products;

(d) automobile and truck tires;

(e) motor oil and lubricants; and

(f) other materials and supplies as determined by the department of administration.

(2) It is the goal of the state that by January 1, 1996, 95% of the paper and paper products used by state agencies, universities, and the legislature must be made from recycled material that maximizes postconsumer material content.

(3) Prior to January 1, 1996, the state shall, to the maximum extent possible, purchase for use by state agencies paper and paper products that contain postconsumer material rather than new material.

(4) To the extent practical, guidelines for the recycled material content of paper should be consistent with nationwide standards for recycled paper.

(5) The department and the department of administration shall establish a joint recycling market development task force. Task force membership must include but is not limited to representatives of the recycling industry, wholesalers, state agencies, and citizen and environmental organizations, as well as other interested persons. The task force shall:

(a) assist the department of administration in developing purchasing specifications as required in subsection (1);

(b) develop additional mechanisms for state government to develop markets for recycled materials;

(c) identify procurement barriers that discriminate against the purchase of supplies and products that contain recycled material; and

(d) develop recommendations for an informational program designed to educate state employees on how to reduce waste and recycle in the workplace.

**75-10-807. Requirement to prepare and implement state solid waste management plan.** (1) As a basis for developing an integrated waste management program and ensuring adequate disposal capacity, the department shall prepare and implement a state solid waste management plan in accordance with this part.

(2) The plan must be comprehensive and integrated and must include at least the following elements:

(a) a capacity assurance element that identifies existing disposal capacity, estimates waste generation rates, and determines the disposal capacity needed for the future and that assesses the potential effect of interstate disposal on capacity;

(b) an element that incorporates federal regulations 40 CFR, parts 257 and 258;

(c) an element that identifies the role of each of the components of the integrated waste management priorities contained in 75-10-804 in meeting the solid waste reduction target in 75-10-803;

(d) a technology assessment element that assesses the availability and practicality of alternative technologies for solid waste management;

(e) an education and public information element that identifies existing education and information programs and describes how the state will increase the awareness and cooperation of the public in environmentally safe solid waste management;

(f) a special waste and household hazardous waste element that identifies types and quantities of wastes that create special disposal problems and recommends methods for reducing, handling, collecting, transporting, and disposing of those wastes and that identifies existing and future strategies for managing those wastes;

(g) an element that identifies the needs of rural communities and management strategies to address those needs;

(h) an element that identifies mechanisms to ensure proper training of landfill operators; and

(i) a timeline and implementation strategy for each of the plan elements.

(3) The plan must be developed with the involvement of local officials, citizens, solid waste and recycling industries, environmental organizations, and others involved in the management of solid waste.

(4) The department shall conduct hearings as provided in 75-10-111.

(5) The plan must be evaluated every 5 years and updated as necessary.





## **APPENDIX B**

### **EXPRESSED PUBLIC CONCERNS ABOUT WASTE REDUCTION AND RECYCLING**

These comments are paraphrased, composite statements made by Montana citizens at a series of public meetings held in 15 locations around the State of Montana between January 27 and March 12, 1992.

#### **SOURCE REDUCTION**

We put source reduction at the top of the list, but leave it out of the discussion. These options need more investigation. The plan should identify barriers to reduction that we might be able to overcome.

Source reduction is the most important part of the plan. If goods can't be reused, they should be taxed. That will help pay for disposal and discourage their use. Those products could be banned. Disposable items should carry all their own costs, including disposal.

Communities are up against major regional corporate decisions by distributors on product packaging. We need more clout to tell distributors what we want. We need options when we purchase. We must put pressure back on the manufacturers. They made it, they don't give us much choice in how it's packaged or how its presented to us.

Stores should sell cloth bags where some of the proceeds go to environmental groups. Seattle's Quality Foods Corp is already doing this.

Packaging of appliances should be made semi-permanent. We should pay a returnable deposit on cartons.

We shouldn't be afraid to put regulations on businesses. Make them responsible for dealing with the products they create. When they know the rules, they come up with creative solutions, which usually turn into profits.

The state should establish tax credits for businesses producing or using reusable packaging. Establish a state tax or surcharge on products, packaging, and disposal methods that contribute heavily to the waste stream.

Lets not underestimate the power of the individual to make good choices when we purchase. The plan should emphasize this, we can't look only to the state and federal government to do all this.

A precycle campaign in grocery stores and other retail stores would help consumers make better choices. Some states, like Vermont, make shelf labeling mandatory.

Source reduction, telling retailers what you want, letters to companies are all important.

The state should promote businesses which are making an effort at waste reduction. Give them a seal of approval if they reach certain standards.

The plan must encourage volume-based rates. Volume-based rates should be required state-wide, so one community doesn't suffer the consequences of being the first to do the right thing. We must all be responsible for the amount of garbage we generate.

Schools and cities have banned styrofoam, couldn't the whole state do it?--for other products as well.

Public education should be integral to the plan. The state plan should BE education--not mandates or even guidelines.

The state should have an aggressive public education program--newsletters, public awareness training, traveling road shows, radio, newspaper, TV spots shown regularly, and active participation in community awareness projects. The state should explore other state's incentives for education programs, foster joint private/public task forces and work with newspapers on source reduction and recycling promotion.

The state should have a better information dissemination system. Particularly, they should produce videos, fact sheets or bulletins of model projects with specific information on the project.

Get local businesses to help with education campaigns. They could disseminate information. Reward them with good publicity. Get them to buy into a precycle program.

## REUSE

We need incentives for new product design which take into account recycling and reuse. If products can be easily disassembled and reused, the manufacturer will want them back.

The plan should support deposit legislation for bottles and other containers. We should reintroduce the bottle bill.

We should have more reusable containers--definitely refillable motor oil and pesticide containers as well as beer, milk and pop bottles.

We should use the oil recycling sign legislation as a model for other products. Retail stores should indicate where all kinds of used product can be dropped off for resale or repair. Give the retailer more responsibility for reuse/recycling/collection.

The plan should recognize that food banks, thrift stores, etc. are already keeping things out of the landfill.

Contractors should be required to separate out their usable construction waste and put it in a different section of the landfill where others would be allowed to go in and purchase or pick up what they need. It's too valuable to waste.

We need reuse and repair centers at each landfill. We should pull out reusable items from the waste stream.

The state needs to relax its rules about daily cover and salvaging, if reuse is going to work at the landfill.

Existing law says that salvaging is prohibited unless the MDHES agrees that it is being done properly and safely. Everyone has interpreted this to mean you can't do it. The MDHES could help us figure out how to salvage properly instead of discouraging it.

Landfills should have swap lists or swap phone lines, pull out reusable items, and let the public know what's there to be reused.

Reusable items must be separated before they reach the landfill.

## RECYCLING

The plan should emphasize education. The state should have pamphlets, brochures, workshops--a major campaign for children and adults. Leadership needs to be informed. An informed public will want to recycle.

We need to collect information from other states on all kinds of recycling programs, organize it, computerize it, and get it out to Montana communities.

Do we really need more recycling education? Everybody knows about it and is in favor of it. What they need are incentives to do it. We need the will and the leadership.

There should be more education programs at schools. Schools and all state institutions should be required to recycle. It should be more specific, with more comprehensive requirements than what we have now.



The plan should provide encouragement and models for recycling. Recycle Missoula uses all volunteer efforts. It's not going to work in every community. Consumers must accept personal responsibility for reducing waste, they must pay for recycling. We pay for sewage treatment, fire and police protection because they are public benefits. Recycling should be the same. Communities should not count on income from the sale of recyclables.

Models must call for source-separated materials. It gives you a higher quality product and is a useful public education tool.

We should add value to materials by reusing or recycling them. If any material can be "valorized", then it shouldn't be put in a landfill. That should be the definition of "recyclable". The plan must be broken down to individual waste streams. The Government should be creating a market by buying recycled. People want to recycle, but we don't have the market.

Recycled retail products are popular. We must be sure they are really recycled. The state should set standards. Some companies make bogus claims just because it sells.

We must be able to define what a "recyclable" is and then determine who owns it. The definition of "recycled" must mean "post-consumer".

The state doesn't produce enough materials to support the recycling industry. 800,000 people isn't enough to justify the investment. It would require incredible government subsidy. Don't ban anything from the landfill; it will just be stockpiled. Let's get off the recycling kick. Waste reduction, reuse, bulk buying and composting are better answers. Recycling doesn't pay.

Recycling programs are difficult due to unstable markets and long distances to markets. Freight costs are prohibitive.

When the state does an Environmental Assessment on a landfill, the regulators should have a way of always encouraging (or later requiring) recycling and waste reduction. The annual license renewal would be a good vehicle.

Incentives should be given to remanufacturers to set up businesses in Montana, to become the end users for Montana's recyclables.

Market development is the main thing the state can do to help recycling. The government is probably the biggest buyer of certain items. The state should encourage more unified buying.

To create markets, the state must take both a carrot and a stick approach--both incentives and taxes. Give incentives to recycling businesses and transportation systems.



Provide tax deduction for buying recycled products. Reward businesses that do it right with a Green Seal Program.

Industry is not resistant. They are gearing up to accept post consumer material, but the collection systems have gone on line quicker. It will take time for the markets to react. The state's commitment must be to create new markets.

California requires all newspapers to use 40% recycled paper. That's exactly what we need to do. It encouraged mills to make the investment and they were anxious to do so. Laws should require use, not collection.

There needs to be a pooling of resources so communities can buy balers for cardboard, plastics, etc.

Recyclables should be baled and stored until a large enough volume exists. The state must support this.

Perhaps we should at least ban white goods from the landfill then send around a crusher like the Junk Vehicle program.

Montana should have more materials recovery facilities like the one in Victor to reduce volume in the landfill.

The plan should take an institutional approach to recycling--implementing curbside pick ups and commercial collection. Recycling should be more than a hobby.

Manufacturers should give more information on their packaging about what can be recycled.

## COMPOSTING

Grass clippings should be left on the yard. People should have smaller grass patches anyway to conserve water. The state should educate people for different yard maintenance systems.

Leaves and grass should be composted. The state should provide grants for equipment like grinders and chippers to make composting work for branches.

Composting can work, but it will take time and money.

We should ban grass and leaves from the landfill and compost them. We don't have to build a recycling center for them and someone can always use the compost.

We should be able to compost at Class III landfills and also be able to have temporary storage of white goods at Class III landfills.

We've talked about composting at our new landfill. We have the space, just not the time to figure it out. We're way behind with our old landfill and don't have the resources.

Composting is working. It costs money, but not a lot. There is no problem in marketing. The public can pick it up and it is also used for landfill cover. What is really needed is a tub grinder. We could compost all the branches and wood products in addition to leaves and grass.

There are public versus private issues in composting. The state should offer help, but be careful about competing with private industry. The state is discouraging some composting operations with excessive regulation. We're discouraging what we say we're promoting. If EKO-Kompost closes, we'll go back to land application of sewage sludge. That's regressing, not progressing.

The state must make sure the fee structure doesn't reduce the incentive to compost or recycle.

Compost can be contaminated and poison your garden. We'd need to inspect each and every branch. There is a cost to composting. It's not realistic. The markets aren't there for compost either.

Compost can always be used as landfill cover, at construction sites or reclamation sites. If properly run, contamination will not be a problem.

Garbage companies should provide backyard composters to any customers who want them.

## INCINERATION

Incineration should not be higher on the priorities than landfilling. We should not be encouraging incineration in our mountain valleys. It should not be on the list at all.

Solid waste systems should look at all possible methods. Don't throw out incineration, it might be a piece of the picture for some communities. We should be able to choose to pollute the air instead of the water if we desire.

The Livingston incinerator is a good idea, except that it was set up for one industry. We should burn more to save landfill space.

With incineration, we're sacrificing the air to save the land. That's not a good trade off.

Mass burn incineration should absolutely not be considered. There are problems with ash, problems with air pollution, and it works against reduction, reuse, and recycling.

We should separate waste before incineration and composting.

Incineration should be a policy of last resort.

Incinerators are a very expensive solution. We need to look for more practical, low-tech, less expensive solutions.

We should allow the burning of oily wastes, not the most hazardous wastes, in industrial burners.

## LANDFILLING

In all this talk about the costs of recycling, let's not forget that there are also costs to throwing it away. We need to analyze all the costs--environmental, avoided landfill costs, costs of cleaning up an aquifer.

Right now it's a lot cheaper to landfill than recycle. The plan must recognize that. Landfill fees must go up to drive recycling.

The plan should require that landfills be designed for zero discharge of leachate. Adopt stringent ground water monitoring rules. Establish minimum mandatory penalties for ground water pollution from landfills. Require ground water monitoring of all old, closed dumps. Establish an abandoned landfill clean-up fund for reclamation of leaking landfills. Require municipalities which want to permit a new landfill to first analyze and evaluate source reduction and recycling options before a permit is granted. Require recycling centers to be located at all landfills. Establish a state fund for comprehensive waste management assistance to local governments. Provide tax incentives for mining old landfills. Include mining of old landfills as part of the plan. Streamline permitting as it relates to composting, recycling, and household hazardous waste (HHW) disposal. Mandate composting and HHW collection centers at all landfills. Ban certain recyclable materials such as aluminum from landfills.

Tarping regulations should be better enforced.

New landfills should have areas for recyclables, white goods, composting, waste oil collection, and household hazardous waste collection. Citizens should be able to take everything to the landfill. They must meet or exceed all subtitle D regulations. Scales are needed to calculate the effect of recycling.



There should be industrial parks at landfills to remove recyclables, construction wastes, and compost. There should be a repair shop. Communities should be given incentives to do this. They should get a break on their landfill fees.

## IMPORTATION

The plan should consider importation of waste. If we accept the public's waste, it discourages them from doing the right thing. We must make sure anything we accept is after recycling, reduction and reuse has happened in the home community.

The state should discourage waste importation through legislation requiring mandatory source reduction and recycling and should support federal legislation granting states the right to prohibit waste importation. If importation is allowed, the state should encourage stringent regulation, including stringent source reduction and recycling of any waste imported into Montana and stringent Montana Department of Health and Environmental Sciences' (MDHES) environmental regulations for citing.

The plan should address local control. We're concerned about big companies getting a monopoly and reducing our options. We need local control over importation. If a community says no, that should be it. If they say yes, there should still be strict state control.

Maybe Montana should allow waste to come in from out of state to controlled facilities set up to separate and recycle.

There should be no importation under any circumstances.

Importation is the biggest issue. Montanans "do not have to prostitute ourselves or our state to some other states' garbage". This is a moral issue as well as a political issue. Each state should look after its own garbage.

The plan should address importation. Montana should be careful of shutting off our borders. We could kill some business. We ship hazardous wastes out, why shouldn't we accept outside waste?

No matter how they build those megalandfills, they are going to leak and pollute our water. MDHES is supposed to be concerned about the public health--you shouldn't let these people in the state.

The MDHES could never regulate large amounts of incoming waste. Hazardous waste would get through.



Megalandfills should be required to put up an indemnity fund. This is different than a bond which is released at some point.

Our ban on solid waste importation may hinder the recycling efforts, may keep out raw materials needed for these businesses. Importation could encourage repossessing.

We should prepare for importation of waste from other states. It's likely to come. We're going to get garbage, not recyclables. We should charge out-of-state waste what it would cost to landfill in their own state. It should go into an earmarked fund to support recycling and education programs.

If we ship in waste we should have assurance that it's 100% free of household hazardous waste.

### SPECIAL WASTES

We should consider taxing certain items that are hard to dispose of such as tires, white goods, oil, etc. The money should be used for incentives or grants for collection programs.

Cities need to be creative at their landfills for recycling used oil, antifreeze, and valuable materials. We should use inmate labor to do separation at landfills.

There needs to be more education of the toxicity of substances such as antifreeze and old batteries. Recycling of antifreeze can be done fairly low tech at fairly low cost.

Landfills should take plastics and batteries, including household batteries, for recycling.

The oil sign law should go farther. Expand it to other hazardous, or difficult to dispose of items. Retailers should tell you what to do with them when you're finished.

There should be a deposit on these items; take them back to the retailer.

State laws prohibit stockpiling of many things such as car batteries. This problem must be solved.

We should tax (\$5?) white goods to fund a program to crush them.

Used tires should be addressed in the plan. They should be broken down for the oil, used in building materials, asphalt, tire derived fuel or processed into new tires. The state should be encouraging these industries, providing tax incentives.

The Federal Highway Act says old tires must go in a certain percentage of new pavement. But in Montana they'll all come from out-of-state. We should get processing plants in Montana ready to do this locally. We should pass a state law requiring use of Montana tires--or giving a preference to Montana tires.

The state should handle tires like the junk vehicle program. Place a fee on tires and have a mobile shredder that goes around the state. You should have to pay \$2 per tire at purchase, not disposal. Otherwise the tire will go into the coulee.

The plan should deal with hazardous substances that end up in the landfill. Communities should establish household hazardous waste (HHW) collection days. This could be handled locally. The plan should make this easier. If not curbside collection, then education programs at the least. Relax our laws that make this so difficult. The state should organize collection days in a region to help out on transportation issues.

The plan should promote education on alternative products that are less hazardous, less of a disposal problem.

The plan should encourage collection days or look at more low-tech solutions such as paint swaps and education.

The plan must deal with small quantities of hazardous waste. Collection days must be managed better than last time. You should always have the next one scheduled. There should be a state-owned hazardous waste transfer station and an in-state disposal facility.

Pesticides are going to be coming in reusable containers. Can Montana encourage this? We need to work with the industry, ask them to help us, not make demands on them.

There should be a unified state agency effort for proper disposal of old pesticides.

Industry should take back used batteries, used pesticide containers, tires, etc.

Retailers should accept household batteries. They send them back to the manufacturers. This should be extended to other hazardous products.

Retailers of HHW products should pay or otherwise help solve the disposal problem. They should be given more responsibility.

Individuals must accept more personal responsibility. Consumers are throwing away HHW.

It's difficult to police individuals.

Auto batteries can be recycled, but now there are such severe penalties for spills or mishandling, it's very difficult for the recyclers. Liability is a problem.

Problems with HHW are being swept under the rug by everyone, especially the legislature. There may be hazards to storing and transporting HHW, but there are also hazards to burying it in the landfill.

Montana should have it's own disposal site for hazardous waste. We're not doing our fair share by sending out our wastes, but refusing to take others' waste. We would have some good clay sites.

We could use the missile silos for hazardous waste dumps.

We should make use of bentonite beds to create a hazardous waste dump so we don't have to ship it out-of-state. Contact industry and use their resources to help with the problem.

Agricultural chemicals have a fee tacked on them. Do the same on disposables and household hazardous waste (HHW) products.

The state should organize a call-in exchange program for HHW.

Plan should include a state oil collection program--help local governments figure out such a program. It should be re-refined, not burned. Some local gas station will take it, but they can't use that much.

Perhaps the county should burn more used oil. It works in a good burner, but the bad ones put out awful smoke.

Lets be careful about encouraging the burning of oil. Is it really safe? What's going into our air?

Retailers should have to take waste oil back. The responsibility should be on the one who sells it.

The plan should deal with sewage sludge, septic tank waste, injection well, and sump wastes.

## IMPLEMENTATION

Plan must accept the geographic difference between east and west.



The state will not get a 25% reduction unless you give incentives. You must funnel some of the fees to local governments for planning. We also need to set up collective pools for marketing recyclables.

We should have an electronic network for recycling information.

The plan should encourage local Solid Waste Management plans, recognize them, and fund them. A 25% goal is achievable if local governments have financial support. I want to see that commitment in the plan.

I doubt the public would pay any attention to a long-range plan, unless it recommends their back yard for disposal.

Plan should include an economic analysis of recycling programs and HHW collection programs. It should look at all the costs, even the hidden ones--such as the cost of building a new landfill.

The plan must be flexible for different communities. Markets haven't gained maximum strength. The plan shouldn't act like they have.

We can pay to throw things away, or use that same tax money to compost or recycle it. We have choices. We can choose a different rate structure that encourages personal responsibility. We should have a community citizens' solid waste task force.

The state should increase taxes to pay for recycling.

Communities must support the private industry, government should not do recycling.

The plan should be short and readable. Don't put restrictions without money and alternatives.

The plan shouldn't pass on big costs to little towns--we're already paying landfill fees. You must address the issues of costs--you regulators need to be more concerned about costs.

The plan should recognize that rural Montana has different problems than urban communities.

If the state wants a 25% reduction, they're going to have to help pay for it. There should be a grant program. We subsidize farmers, why not recyclers. We should pay recyclers or truckers for their losses.

We don't want to pay people to be losers. The state will just take the money from us, or cut some other state program. Incentives are wonderful if you have money.



Civic groups and organizations will have to make recycling work for rural communities. They could organize transportation of cardboard for example.

The plan must be a tool that communities can use to setup programs. It should have specific guidelines or standards. We're paying for it. That money should go for recycling programs, not more regulation.

Everybody says no more taxes--it's got to cost more. Either the cost of throwing it away must go up, or we've got to get more out of our recyclables.

Local governments and groups need to be involved in the plan the whole way. It must not include elements which we can't comply with because of cost and complexity.

The plan must have a direct bearing on the economics. There needs to be an economic analysis of all recommendations included in the plan.

The state should explore economic incentives and funding mechanisms for local government solid waste planning. The Treasure State Endowment, if passed, should be expanded to include solid waste systems.

The state must support local governments, be a resource to them. We must encourage coalitions between government and the private sector.

Plan must address the relationship between EPA, state, and county. It's hard to get the answers we need when responsibility is shuttled between them. The plan should address clear lines of responsibility and authority.

Montana should get together with other states such as Minnesota. The plan should review and report on what's working in other states.

## TRANSPORTATION

The state must help coordinate transportation systems. Distance to markets is a big barrier. Montana should join in regional efforts with other states in figuring out transportation networks and providing capital for recycling industries.

The state should provide incentives for truckers to haul or back haul recyclables.

Freight is a big problem. We need to allow recycled items to be exempt commodities so we can get the cost down. Anybody should be able to haul them. This will encourage back haul. Those who bring paper into the state should be required to take just as much out with them. You're destroying recycling by allowing monopolies in hauling recyclables.

Public Service Commission (PSC) permits discourage recycling. Communities are locked into one hauler. The plan should explore exemptions from permitting for hauling recyclables. There needs to be incentives to haul, not disincentives.

I'm concerned about the mess of regulation in hauling and disposal. Must be more coordination between the PSC and the Montana Department of Health and Environmental Sciences. There are dangerous trends toward concentration in the hauling industry and regionalization of landfills. We must be more concerned about monopolies. The PSC should be regulating rates.

The PSC needs to regulate disposal rates. This will encourage public landfills to show all their costs, and keep the private landfills from overinflating costs with respect to the new regulations. The public will be better protected.

The PSC should not be involved in any permit system for landfills. They've made a mess of the hauling permits. They've guaranteed monopolies for the biggest companies and do not regulate rates. They should regulate rates, not permits.

We should be thinking about the export of waste by rail, both garbage and recyclables. We need to think about the economies of scale that railroads can provide. We need to be thinking about rail access. In other states, railroad cars or boxes designed to fit on rail cars are used for storage in communities.

We should put railroad cars on sidings to accumulate recyclables. Railroads could solve the problem.

The state should coordinate with railroads, provide some incentives for them to haul the recyclables.

The problem with transportation is that the trucking industry is so strong.

The state should give the transportation companies incentives to back haul recyclables. A 25% tax credit should be expanded to the transportation industry.

## GENERAL

We need to quit saying that we can't do it--composting, recycling, or any of it. We need to find out how to do it.

Regional associations ought to be created and get together on a regular basis to let each other know what's going on.

We have to understand the real costs and ask when we want to pay, now or later.

We need to look at regions in the state as a whole for the 25% reduction goal, not individual landfills. Western Montana needs to do more. They have more access to the markets.

People come to Montana for the good environment. We haven't done such a bad job. Out-of-state people come here for the clean environment and make a mess.

We haven't done badly, but still we need a plan--put together the best plan in the United States. Let's strive for the best.

The plan must keep in mind that not all the issues are local, some are state, regional, and national.

We should do more than encourage and create models. The plan should have some teeth.

When you write the plan, tell us what suggestions you are accepting and rejecting.

A 25% reduction goal should be expanded 40% in 1998, 60% in 2000.

The plan should address the costs of all waste management methods. None of them are free, none are cheap. We must compare these programs against the cost of landfilling.

We must consider all the costs--including the loss of finite resources, costs of resource extraction.

The plan should look at the largest contributors to solid waste. Yard waste is one of them. The plan can't go too many directions.

The plan must look long-term. Don't ask just what we can do in the next two years.

Make mandatory all waste reduction, recycling, and purchasing targets articulated in HB 160 with penalties and fines for non-compliance. Emphasize mandatory requirements for purchase of products made from recycled materials. Require monitoring and reporting of volumes of waste that are recycled and landfilled.

The plan should support stronger regulation of mining's forestry's, coal's and petroleum's solid waste to prohibit degradation of air/water/soil by such waste. The plan should support adoption of the National Toxics Campaign's model state program. Plan should support reduced use of chemical pesticides for weed control and increase use of integrated pest management and other sustainable agricultural practices.

We should move back to public operation of waste systems. Private operators will fight recycling and other solutions.



Private companies, responding to local government requirements, might be a better way to run solid waste systems.

There should not be a mandate to privatize. It must stay in the hands of local government. We're directly responsible to the taxpayers as elected officials.

The plan should have on-going review every two years, not just at 5-years. There should be regular reports on state government procurement of recycled products.

The plan needs to work with Indian tribes.

The plan should examine Montana's motivation for reduce, reuse, recycle. It seems like just a trendy thing. What are the real problems in Montana? If it costs more, we shouldn't be doing it. We have lots of barren country. There is no water and there are no people near places like Jordan and Roundup.

Most of what ends up as solid waste originates out-of-state. We need some type of national tax on non-recyclable products. Montana is assuming the disposal costs of products that are making money for other states. We should not be so afraid to put some of the costs back on them.



## APPENDIX C

### EDUCATIONAL RESOURCES FOR INTEGRATED WASTE MANAGEMENT

#### MONTANA WASTE EDUCATION CONTACTS

Many of the Montana groups listed in Appendix D provide educational materials and should be contacted for their latest list of available materials. The state-wide leader in the area of educational materials for integrated waste management is:

**Montana State University Extension Service/ Solid Waste Education Program/** Taylor Hall  
Bozeman, MT 59717/ 994-3451 /Michael Vogel - Program Specialist

#### NATIONAL AND REGIONAL WASTE EDUCATION CONTACTS

**U.S. Environmental Protection Agency's RCRA Hotline --** 800-424-9346

The EPA provides over 25 solid waste publications including school curricula, bibliographies, consumer guides, factsheets, decision-maker guides, and general adult education materials.

**Washington Department of Ecology/** Publications Office/ Mail Stop PV-11/ Olympia, WA  
98504-8711/ (206) 438-7472

The Washington Department of Ecology publishes an annual directory of *"Environmental Education Resources"*. The directory is organized by subjects, including one on Waste Management. The directory lists publications, booklets, brochures, audio/visuals, curricula, displays, posters, fact sheets and miscellaneous items which are available from the Department and provides a description of each.

**Wisconsin Department of Natural Resources/** Education Programs/ Bureau of Information and Education/ P.O. Box 7921/ Madison, WI 53707

The Wisconsin Department of Natural Resources publishes a *"Recycling Study Guide"* as a resource for teachers. It contains a list of additional resources.

**Seattle Tilth Association/** 4649 Sunnyside Avenue North/ Seattle, WA 98103/ (206) 633-0224

The *"Community Compost Education Program"* is a series of four brochures on home composting.

## CURRICULUM MATERIALS

**A-way With Waste - A Waste Management Curriculum for Schools/** Publications Office  
Mail Stop PV-11/ Olympia, WA 98504-8711/ (206) 438-7472

K-12 waste management curriculum which explores issues surrounding waste management and particularly emphasizes that individual revision of buying and disposal practices can protect the environment from degradation by waste.

**Classroom Activities/** Maine Office of Waste Recycling and Reduction/ State House Station  
130/ Augusta, ME 04333/ (207) 289-3154

**Let's Reduce and Recycle: Curriculum for Solid Waste Awareness/** EPA/ 530-SW-90-005  
Call 800-424-9346

This EPA curriculum presents lessons and activities to teach students in grades K-12 about solid waste generation and management. Each unit presents a series of related lessons with vocabulary words, discussion questions, and projects.

**Project Eco-School/** 881 Alma Real Drive, Suite 301/ Pacific Palisades, CA 90272

Project Eco-School (PES) is a non-profit Environmental Education Resource Center functioning nationally as a network between schools (students, faculty, administrators, and parents) and the abundant environmental educational resources available. The PES environmental library of periodicals, videos, curricula, and more is growing rapidly and provides an invaluable "one stop shop" for anyone interested. They have compiled a guidebook *"Blueprint for a Green Campus"*, and developed prototype schools where environmental programs are tested for effectiveness.

**Think Earth - Environmental Education Program/** Educational Development Specialists  
5505 East Carson Street, Suite 250/ Lakewood, CA 90713

This program offers a comprehensive curriculum for grades K-6 that addresses all elements of the environment--air, land, water, and energy.

## SELECTED MONTANA SOLID WASTE EDUCATIONAL MATERIALS

The following are available from the Montana Environmental Information Center, P.O. Box 1184, Helena, MT 59624. Phone (406) 443-2520.

### **Montana Recycling Guides:**

A Guide to Reducing • Re-using • Recycling - Eastern Montana (Includes Baker, Billings, Glasgow, Glendive, Miles City, Sidney, Wolf Point, and surrounding areas)

A Guide to Reducing • Re-using • Recycling - South-Central Montana (Includes Anaconda, Bozeman, Butte, Helena, Livingston, and surrounding areas)

A Guide to Reducing • Re-using • Recycling - Western Montana (Includes Darby, Hamilton, Kalispell, Libby, Missoula, Polson, Whitefish, and surrounding areas)

A Guide to Reducing • Re-using • Recycling - North-Central Montana (Includes Chester, Cut Bank, Great Falls, Havre, Lewistown, and surrounding areas)

All remaining materials are available from the MSU Extension Service, Solid Waste Education Program, Taylor Hall, Bozeman, MT 59717. Phone (406) 994-3451.

## Visuals

### **Solid Waste General**

Videoprogram (OY & A) - Fueling the Future: No Deposit-No Return, 60 minutes, 1988

Videoprogram (OY & A) - How The Waste Was Won: Source Reduction and Recycling in the West, 12 min, 90 Videoprogram (E, Y) - The Rotten Truth, 30 minutes, 1991

Videoprogram series (PO) - Ask the Right Questions is an eight-part series (taped from national Solid Waste Conference), with discussion booklets, to assist public officials to objectively review community waste management options. The series includes:

Program 1 - Critical Issues

Program 2 - The Decision Making Process

Program 3 - Landfilling

Program 4 - Material Recovery

Program 5 - Returning Waste to the Soil

Program 6 - Waste-to-Energy

Program 7 - Credibility

Program 8 - Tools of the Trade

### **Source Reduction**

Videoprogram (OY & A) - Environmental Shopping, 32 minutes, 1992

Videoprogram (OY & A) - Montana Precycle Shopping Program, 6 minutes, 1991

### **Recycling**

Videoprogram (E) - Mister Roger's Neighborhood: The Environment and Recycling, 30 minutes, 1990

Videoprogram (Y) - The Wonderful World of Recycle, 13 minutes, 1990

Videoprogram (Y & OY) - Recycle This - Rock'n, Roll and Recycling, 30 minutes, 1990



## **Composting**

- Videoprogram (PO) - Leaf Composting: Windrows of Opportunity, 15 minutes, 1990  
Videoprogram (OY & A) - Home Composting - Turning Your Spoils to Soil, 17 minutes, 1991  
Videoprogram (OY & A) - Newspaper Shredding for Animal Bedding, 15 minutes, 1991  
Videoprogram (PO) - Recycling Yardwaste - A Tour of Community Programs, 35 minutes, 1992  
Slide Programs (PO) - Yard Waste Composting for Municipalities, long version - 66 slides, short version - 43 slides, 1990

## **Household Hazardous Waste**

- Videoprogram (OY & A) - Cleaning Up Toxics At Home, 25 minutes, 1991  
Videoprogram (PO) - Knox County Tenn. Household Toxics Roundup, 30 minutes, 1991  
Videoprogram (PO) - Organizing Rural Household Hazardous Waste Collections, 32 minutes, 1991  
Videoprogram (PO) - Organizing and Funding Household Hazardous Waste Collection Programs for Rural Communities, taped from 9/22/92 national teleconference, 2 hours, 1992  
Slide Program (OY & A) - Disposal of Household Hazardous Waste, 69 slides w/ audio tape/script, 10 min. 1992  
Slide Program (OY & A) - The Hazard Free Home - Product Alternatives, 65 slides w/ audio tape/script, 1992

## **Landfill Operations**

- Videoprogram (PO) - Promote Landfill Alternatives Now (taped from University of Tenn., Sept. 14, teleconference), 1992

OY - Older Youth (Grades 9-12)  
A - Adults  
Y - Youth (Grades 5-8)  
E - Elementary  
PO - Public Officials

## **Consumer Education Resources**

### **Solid Waste Teaching Packet:**

Solid Waste Management - The Garbage Crisis teaching packet and plan with teaching objectives, discussion sheets, step-by-step teaching instructions, factsheets, set of 35



transparencies, program presenter evaluation, participant evaluation, and pre/post test. The teaching plan is divided into four parts:

- Part 1. Introduction - The Solid Waste Issue
- Part 2. Managing Solid Waste - The Three R's: Reduce, Reuse, and Recycle
- Part 3. Composting
- Part 4. Household Hazardous Wastes and Waste Management Summary

**Solid Waste Factsheets:**

- a. You and Your Garbage
- b. Source Reduction - Precycle
- c. Recycling in Montana: Answers to Frequently Asked Questions
- d. Balancing the Recycling Equation
- e. Alternatives to Hazardous and Hard-To-Dispose-Of Household Products
- f. Are There Hazardous Wastes In Your Home?
- g. Household Hazardous Waste - Disposal Recommendations
- h. Office Paper Recycling - It's Good Business
- i. Building Bins and Boxes for Yard Waste Compost
- j. Do-It-Yourself Storage Projects for Recycling "Good" Garbage
- k. Home Composting
- l. Dealing With Used Oil and Other Automobile Wastes

**Home Compost Education Program**

Home Compost Education Program featuring video - Home Composting - Turning Your Spoils to Soil (17 minutes) and factsheets

**Source Reduction Community Education Program:**

Precycle Education Program featuring:

- a. Precycle shopping program with Buttrey Foods
- b. Training of community volunteers and store employees
- c. In-store shopping tours with community volunteers
- d. In-store information centers manned by community volunteers
- e. Distribution of Solid Waste factsheets
- f. Precycle Shopping Program Planning and Marketing Guide, with video tape. This guide outlines the steps to plan and market a precycle shopping program for waste reduction.

The Precycle Program was created as a pilot program conducted in Great Falls during the spring of 1991 and is currently being implemented throughout Montana and is being sponsored by Buttrey Food and Drug.

**Household Hazardous Waste Community Education Program:**

The Hazard Free Home is a community household hazardous waste education program created as a result of 1991 Montana House bill 858. The program features include:

- a. Development of a self-guided and self-contained teaching packet to train community volunteers
- b. Development and distribution of slide presentations: Disposal of Household Hazardous Wastes and The Hazard Free Home - Product Alternatives
- c. Distribution of Household Hazardous Waste Diagnostic Wheel
- d. Distribution of Household Hazardous Waste Consumer Factsheets
- e. Hazard Free Home "training the trainer" workshop series for community volunteers

**Youth Waste Management Activities****A-way With Waste Teacher Education Program**

A-way With Waste is a K-12 interdisciplinary self-guided/self-contained curriculum written and developed by the Washington State Department of Ecology. Through the development of a "Montana Supplement Guide," the A-Way With Waste curriculum has been customized to Montana. The supplement contains Montana solid waste facts and figures and a list of teacher resources available in the state. A-way With Waste training sessions are coordinated and offered each summer for 2 hours of academic credit by the Montana State University Extension Service and the Beartooth Resource Conservation & Development Office.

**Solid Waste Teacher's Resource Tool Kit**

Loan library of waste management videos and curriculum targeted for grades K-4 and 5-8. The Tool Kits contain age appropriate educational video-tape, at least one solid waste activity curriculum, and several popular solid waste books. The Tool Kits are developed with funding from the Montana Environmental Information Center.

## **APPENDIX D**

### **MONTANA INTEGRATED WASTE MANAGEMENT RESOURCES**

Note: All phone numbers are in area code (406), unless specified. All cities are in Montana (MT) unless specified.

#### **STATE-WIDE INTEGRATED WASTE MANAGEMENT CONTACTS**

##### **Montana DHES Solid Waste Program**

Jon Dilliard, Program Manager  
836 Front Street  
Helena, 59620  
444-1430

##### **Montana State University Extension Service Solid Waste Education Program**

Michael Vogel, Program Specialist  
Taylor Hall  
Bozeman, 59717  
994-3451

##### **Montana Waste Education Coalition**

c/o Michael Vogel  
MSU Extension Service  
Taylor Hall  
Bozeman, 59717  
994-3451

##### **Montana Community Recycling Association**

c/o Montana Env. Information Center  
P.O. Box 1184  
Helena, 59624  
443-2520

##### **National Center for Appropriate Technology**

P.O. Box 3838  
Butte, 59702  
1-800-428-1718  
or 494-4572

##### **Business Development Task Force**

John Biggs  
DNRC-Energy Division  
1520 East Sixth Avenue  
Helena, 59620-2301  
444-6697

##### **Montana Association of Counties**

Gordon Morris  
Montana Association of Counties  
2711 Airport Road  
Helena, 59601  
442-5209

##### **Montana League of Cities and Towns**

Alec Hansen  
League of Cities and Towns  
208 North Montana Avenue  
Helena, 59601  
442-8768

##### **Montana Environmental Information Center**

P.O. Box 1184  
Helena, 59624  
443-2520

##### **Keep Montana Clean and Beautiful**

Peg Likens  
Keep Montana Clean & Beautiful  
P.O. Box 5925  
Helena, 59601  
443-6242

**Northern Plains Resource Council**  
419 Stapleton Building  
Billings, 59101  
248-1154

**Montana Audubon Council**  
P.O. Box 595  
Helena, 59624-0595  
443-3949

**Alternative Energy Resource  
Organization**  
44 North Last Chance Gulch  
Helena, 59601  
443-7272

**Montana League of Women Voters**  
3921 7th. Ave. South  
Great Falls, 59405  
453-6874

**Montana Family and Community  
Education Council**  
Dorothy Skyberg  
Environment Coordinator  
HC 65-Box 20  
Fort Peck, 59223  
485-2025

**Montana Environmental Education  
Association**  
P.O. Box 928  
Dillon, 59725  
683-3984

**Browning-Ferris Industries**  
P.O. Box 8449  
Missoula, 59807-8449  
543-3157

**Pacific Steel, Hide and Fur**  
P.O. Box 1549  
Great Falls, 59405  
727-6222

**Montana Recycling**  
806 West Spruce  
Missoula, 59802  
721-1120

**Montana Industrial Waste Exchange**  
Montana Chamber of Commerce  
P.O. Box 1730  
Helena, 59624  
442-2405

## SOURCE REDUCTION AND REUSE PROGRAMS

### Precycle, Environmental Shopping Education Program

Mike Vogel, MSU Extension Service, Taylor Hall, Bozeman, 59717, 994-3451  
The Precycle Program is a community volunteer education program to provide public awareness of packaging that is excessive, locally recyclable, and has recycled content. Programs have been conducted with Buttrety Food and Drug.



Programs Conducted or Planned:

Great Falls, Claire Del Guerra, 727-4643  
Missoula, Nancy McCourt, 721-2706  
Helena, Peg Likens, 443-6242  
Ennis, Janet Bean-Dochstuhl, Trash In Transit, 682-4463  
Butte, Harold Johns, 723-8262  
Billings, Bernice Mason, 256-2828  
Kalispell, Susan How, 756-5680  
Bozeman, Nancy Guynn, 585-1325  
Anaconda, Barbara Andreozzi, 563-8421  
Chinook, Paula Enkerud, 357-3200

Creative Resource Management

Susan Duncan, 1050 Thorpe Road, Belgrade, 59714, 388-1809. Exhibits of 60-118 items made from throw-aways were displayed at the Bozeman Recycling Festival, Museum of the Rockies, Women's Week, and 1st Bank, Bozeman, all in 1991. Talks, demonstrations, and classes were presented for schools, civic clubs, professional organizations, and scout troops. Creative fabric recycling was demonstrated.

RECYCLING COMMUNITY PROGRAMS, OPPORTUNITIES, AND CONTACTS

ABSAROKEE, 59001

Absarokee Recycling, Milligan's IGA, 328-4314

ANACONDA, 59711

Aware, 1200 East Park, 563-5229

Smelter City Recycling, 18 Landfill Road, 563-5157

BAKER, 59313

Baker Hide and Recycling, Highway 7 North, 778-2710

## BILLINGS

Billings Recycling, 458 Charles Street, Billings, 252-5721

Bright n' Beautiful, Carolyn Miller, P.O. Box 7103, Billings, 59103, 255-7160  
Bright n' Beautiful has organized Glad Bag-A-Thon, Hedgerow, and Proctor & Gamble Projects.

Browning Ferris Industries, 248-5400

Carl Weissman & Sons, 3215 1st Avenue South, 1-800-332-7579

Golden Recycling & Salvage, 1100 6th Avenue North, 252-8080

Pacific Steel and Recycling, 777 4th Avenue, 245-3133

## BOULDER, 59632

Boulder River Industries, 310 4th Street, 225-3311

## BOZEMAN, 59715

Bozeman Recycling, 725 East Cottonwood, 587-4853 or 587-8775

Bozeman Recycling Coalition, P.O. Box 6625, 586-7129, Shannon Waldon, Jennifer Beall, Rick Meis. They have organized recycling fairs, monthly recycling drop-offs, pamphlets, and phone book recycling.

Carl Weissman & Sons, 1237 North Rouse, 587-1285

City of Bozeman, Roger Sicz, P.O. Box 640, 586-3321. The City of Bozeman collects yard waste for compost at the landfill. City shops accept used oil from home oil changes.

KMMS-AM-FM Radio, Tom Barrett, 586-2343. This station broadcasts recycling public service announcements twice daily.

Pacific Steel and Recycling, 315 West Griffin Drive, 587-0662

Pack Tech, Inc., 200 South 23rd Avenue, D-7, 587-0558. Individuals are encouraged to drop-off loose-fill styrofoam (peanuts) for reuse at Pack Tech, Inc.

Recycle-It, 1205 South Willson, 586-2351

Reach, 2134 Industrial Drive, 587-1271

Wheat Montana Bakery, Dean Folkvord, 2700 West Main, 586-9625. They offer a free loaf of bread for the return of 13 empty bread bags.

#### BROADUS, 59317

Broadus Recycling Center, P.O. Box 148, 436-2361

Powder River Recyclers, Box 148; Karen Amende, 436-2361; Julie Riley, 436-2424

#### BUTTE

Butte Drop-off Bins, at Butte Schools (see below)

Butte Recycling Committee, Roberta Stauffer, NCAT, P.O. Box 3838, 494-4572. The committee has placed drop-off bins, and conducted recycling education at Butte schools.

Pacific Steel & Recycling, Short and Gaylord Street, 782-0402

Rosin Brothers, 609 Aluminum East, 782-2341

#### CHESTER, 59522

Hi-Line Voluntary Recycling Center, Hwy 2 East, 759-5538

#### CHOTEAU, 59422

Choteau Recycling Center, 109 Maine Ave. North, 466-5311

#### COLUMBUS, 59019

Columbus Recycling Program, City Hall, 322-5313

CONDON, 59826

Swan Valley Recycling Club, P.O. Box 1129, 754-2289, June Ash, 754-2289. The Swan Valley Recycling Club have conducted waste reduction education.

CONRAD, 59425

Northern Gateway Enterprises, Inc., 3 South Minnesota, 278-7802

CUT BANK, 59427

Cut Bank Hide & Fur, 405 East Railroad, 873-2051

Glacier Action and Involvement Now, Inc., Jerome Gauthier, P.O. Box 1329, 873-2337.  
GAIN is considering the development of a recycling facility and has conducted a feasibility study.

DARBY, 59829

Bitterroot Disposal, 642-3375

DEER LODGE, 59722

Rennfield Metals, 120 South Frontage Road, 846-1726

Powell County Extension Office, Dave Streufert, 409 Missouri, 856-3680. They are sponsoring a demonstration project of shredded office paper as animal bedding at the prison.

DILLON, 59725

Dillon Special Resources, 329 North Pacific, 683-5773

Dillon Recycling, Dan Carpita, 101 North Montana, 683-5352

EKALAKA, 59324

Baker Hide & Recycling, drop point at City Office, 778-2710



ENNIS, 59729

Trash in Transit Recycling, Inc., Box 764, Janet Dochnal, Cindy Leum, Kaye Suzuki, Karen Chapman. This community recycling center accepts aluminum, glass, newspaper, cardboard and steel cans. Waste reduction education programs have been presented to Ennis schools.

GLASGOW, 59230

Milk River, Inc., 219 Second Avenue South, 228-8412

Pacific Steel & Recycling, BN Right-of-Way, 228-8229

GLENDIVE, 59330

Border Steel and Recycling, West Glendive, 365-4398

GREAT FALLS

B&L Towing & Salvage, Wire Mill Road, 761-2049

Carl Weissman & Sons, 300 Third Avenue South, 800-443-5964

Cascade County Extension, P.O. Box 5051, 59403, 727-4643

College of Great Falls, 1301 20th Street South, 761-8210

Filopowicz Brother Salvage, Wire Mill Road, 727-0535

Great Falls Conservation Council, 287 McIvor Road, Great Falls, 59404, 727-7469

Great Falls Recycling, 700 2nd Street South, 452-4192

Pacific Steel & Recycling, 1624 12th Avenue North, 800-332-9930,  
1401 3rd North, 727-6222.

Upper Missouri Breaks Audubon, Box 2362, Great Falls, 59403, 761-8329

Vision 2000 Committee, Chris Ebeling, 1015 Carlos Drive

Waste Management, Inc., 3201 15th NE, 761-2545

HAMILTON, 59840

Ravalli Services Corporation, NE 111 Old Corvallis Road, 363-5400

HARLEM, 59528

Blaine County Activities Center, 606 West Central, 353-2611

HARLOWTON, 59036

Roundhouse Recycling, Nancy and Rick Tuber, P.O. Box 518, 632-5652. This is a community recycling center operated by volunteers.

HAVRE, 59501

Havre Day Activities & Recycling, 235 1st Street West, 265-5506

Northern Montana College, Wanda McKinney, 265-5727, Barb Coffman, 265-4127. They educate the campus community about recycling.

Pacific Steel & Recycling, Highway 2 East, 265-5824

HELENA, 59601

City of Helena Landfill, 447-8459

City of Helena Blue Bag Program and Cardboard Recycling, Kathy Goroski, Recycling Coordinator, 447-8447.

Federal Reserve Bank, Sheila Abrahamson, 100 Neill Avenue, 447-3815. They recycle computer and white paper and laser toner cartridges.

Lewis and Clark County Landfill, 449-2418

Lewis and Clark Solid Waste Task Force, P.O. Box 1723, 59624, Caren Brandenburg. The Task Force distributes recycling materials and conducts "Trash for Trees" collection days.

Helena Recycling, 933 Getchell, 443-7587

Pacific Steel & Recycling, 1530 National Avenue, 442-7851

Scratchgravel Landfill District, Susan Palermo, 1930 9th Avenue, Suite 207, 442-2584

#### JOLIET, 59041

Tri-cyclers, Lisa Gruhen, 962-3249; Jesse Wilson, 332-4261; Bob Logan, 932-5502. This is a three-county group (Stillwater, Sweet Grass, and Carbon) composed of volunteers that have conducted recycling drives, built tow-in recycling bins, and the creation of a lending library of videos, teacher curriculums, and magazines.

#### KALISPELL, 59901

93 Enterprises, P.O. Box 1456, 756-9300

Carl Weissman & Sons, 71 Meridian Road, 755-6588

Evergreen Waste Disposal, 1970 Whalebone Drive, 257-1739

Flathead County Extension Office, Susan How and Bruce MaCallum, 800 South Main, 756-5680. The office has sponsored a project using newspaper as animal bedding.

Flathead Industries, 56 3rd Avenue NW, 755-3280

Pacific Steel & Recycling, Flathead Lane, 755-7011

Valley Recycling, 1410 Hwy 2 West, 257-1739

#### LEWISTOWN, 59457

Pacific Steel & Recycling, 1101 4th Avenue North, 538-5245

Sanitation, Inc., P.O. Box 692, 538-9241

#### LIBBY, 59923

S.J. Orr Services, 2049 Hwy 2 South, 293-3711, or 800-822-1069

LINCOLN, 59639

Lincoln Recycling, P.O. Box 714, 362-4434

LIVINGSTON, 59047

Counterpoint, 116 East Lewis, 222-2472

Park County Environmental Coalition, P.O. Box 164, 222-0404

MILES CITY, 59301

Citizens for Recycling, 111 South Winchester, 232-6021

Eastern Montana Industries, 805 South Haynes, 232-3740

Pacific Steel & Recycling, 803 Phillips, 232-3583

MISSOULA

Browning Ferris Industries, P.O. Box 8449, 543-3157

Missoula Solid Waste Task Force, Shannon McNew, Missoula City-County Health Department, 301 West Alder Street, 532-4770.

Liz Gupton, 2161 South 10th West, 549-5243 or 822-4233. Gupton is involved in the U.S. Forest Service's waste reduction and recycling program. The program includes a video and an electronic newsletter on recycling.

Missoula Recycling, 806 West Spruce, 721-1120

Missoula Recycling drop-off point, Old Hwy 93, 721-1120

Missoula Valley Recycling, 543-2972. This business offers a subscription service to homes and businesses that wish to have recyclables picked up.

Norm's Parts & Recycling, Hwy 93, 251-2635

Pacific Steel & Recycling, 2828 Palmer, 542-0381



Recycle Missoula!, 101 East Broadway, 542-1709, Tony Tweedale, 728-5733, Steve Carroll, 543-2845, Shannon McNew, 523-4755. They focus on waste reduction education, and work with the Missoula County Task Force on issues such as volume-based rates and curbside recycling.

PLAINS, 59859

Little Bitterroot Special Services, 105 West Lynch, 826-3589

PLENTYWOOD, 59254

Doug Smith, County Planner, P.O. Box 191, 765-2310. The Sheridan County recycling group is coordinated by the Eastern Plains Resource Conservation & Development Office.

Glenwood, Inc., 202 East 1st Ave, 765-2040

POLSON, 59860

Folkshop Recycling, 904 1st Street East, 883-6839

Pastor Knudsen, 509 3rd Street West, 883-5409

PONY, 59747

Homecoming Club of Pony, P.O. Box 702, 685-3462; David Zimmerman, Box 253, 685-3481. They have worked on establishing a community recycling program.

RED LODGE, 59068

Red Lodge Recycling Center, 1401 South Broadway, 446-2522; Daniel Lynn, Box 751, 446-2522; Glenda Allen, P.O. Box 1296, 446-2123. They accept aluminum cans, newspaper, cardboard, steel cans, glass, and some plastics.

RONAN, 59864

The Folkshop, 221 Hwy 93 South, 676-5333

SHELBY, 59474

Northern Gateway Enterprises, Inc., 216 6th Avenue North, 278-7802

Shelby Recycling Task Force, Don Feist, P.O. Box 1919

SIDNEY, 59270

Pacific Steel & Recycling, South of Sidney, 482-1301

Richland Opportunities, 1101 Silurian Lane, 482-3341

STEVENSVILLE, 59870

TCR - Toner Cartridge Reconditioning, Dorothy Simpson, P.O. Box 29, 302½ Main Street, 800-735-8532. They recondition toner cartridges for laser printers and copiers; they also produce factsheets about recycled products.

ST. IGNATIUS, 59865

Norton Recycling, 36593 Hwy 93, 745-4504

ST. REGIS, 59866

4-Mile Recycling, Denley M. Loge, 136 4-Mile Road, 649-2368

VICTOR, 59875

Victor Transfer, 2000 Meridian Road, 642-3375

WEST GLACIER, 59936

Glacier National Park Recycling, Mac Donofrio, 888-5441. A waste management program has been established for the park; eleven materials are recycled.

### WHITEFISH, 59937

Flathead Recycling Coalition, Richard Cohen, P.O. Box 1782, 862-5711. The Coalition is a broad-based community group that assists the public in understanding waste management, recycling, and environmental issues in the surrounding area.

Flathead Industries Thrift Store, 3rd Street, 862-5221

North Valley Refuse, 5445 Highway 93 South, 862-4381

### WOLF POINT, 59201

Chamber of Commerce, Sherman Park, IGA Store, 653-2012 or 653-1852

## COMPOST PROGRAMS

Municipal Composting Programs listed below were gathered from the "Survey to Determine Montana Municipal Solid Waste Management Characteristics and Training Needs" and the "DHES Licensing Survey".

### **Local Government Compost Programs**

City of Bozeman. Roger Sicz, P.O. Box 640, Bozeman, 58715, 586-3321

City of Great Fall. Martin Basta, 1025 25th Ave. NE, Great Falls, 59403, 771-1401

City of Sidney. Scott Vanas, 609 8th Avenue SW, Sidney, 59270, 798-3352

Butte-Silver Bow. Gary Keeler, Courthouse, Butte, 59701, 723-8262 ext. 205

City of Scobey. Lane Drury, Landfill Supervisor, Scobey, 59263, 783-5396

Flathead County. Gary Stempin, Box 168, Kalispell, 59901, 752-1174

City of Libby. Ron Anderson, 418 Mineral Avenue, Libby, 59923, 293-7781

Musselshell County Refuse Dist. Transfer Station, 506 Main St., Roundup, 59072

City of Livingston. Ken Kastelitz, 414 E. Calendar St., Livingston, 59047, 222-2005

Valley Co. Refuse District. Jenny Reinhart, Box 534, Glasgow, 59230, 228-8221

### **Private Compost Programs**

The Compost Farm, Thomas Earl, 3000 Black Eagle Road, Black Eagle, 59414, 453-3000

EKO-Kompost, Inc., Edward Clay, 3700 Compost Road, Missoula, 59801

Glacier Gold Compost Manufacturing. L. Peter Larson, Box 128, Olney, 59927, 881-2311

### **Compost Training Programs**

Municipal Compost Management Training MSU Extension Service, Mike Vogel, Taylor Hall, Bozeman, 59717, 991-3451

## **LANDFILL EDUCATION PROGRAMS**

### **Solid Waste Institute of Montana (SWIM)**

Michael Vogel, MSU Extension Service Solid Waste Education Program, Taylor Hall, Bozeman, 59717, 994-3451

SWIM provides continuing education programs for Montana landfill operators, managers. This education program is provided in cooperation with the Montana Association of Counties (MACo), League of Cities and Towns, and MDHES Solid Waste Management Program.

#### **Courses:**

##### **Manager of Landfill Operations (MOLO)**

This is a Certification Course provided in cooperation with the Solid Waste Association of North America and MACo.

##### **Recovery of Refrigerates from Landfilled Whitegoods**

This Continuing Education training program deals with EPA's "No-Vent of Refrigerates" rule. This is provided in cooperation with MACo.

##### **Landfill Closure and Finance Assurance**

This Continuing Education training program deals with EPA's Subtitle D landfill closure requirements. This is in cooperation with MACo.



Solid Waste Management Training Modules: Lessons for Local Government

Midwest Assistance Program, Inc., P.O. Box 81, New Prague, MN 56071;  
(612) 758-4334 or 1-800-822-2981; Cost: \$25.00

The four modules cover recycling, yard waste composting, landfill management, and waste reduction. Each module comes with learner objectives, community impacts, lesson outlines, and paper copies for overhead presentations. Each module can be used individually, and each module contains several lessons.

HANDLING OF SPECIAL WASTES

The Hazard Free Home--Household Hazardous Waste Management

Michael Vogel, MSU Extension Service Solid Waste Education Program, Taylor Hall, Bozeman, 59717

This education program was created for all Montana counties as the result of 1991 HB 858 in cooperation with MDHES Solid Waste Management Program.

City of Bozeman

Roger Sicz, City of Bozeman, P.O. Box 640, Bozeman, 58715, phone: 586-3321

The City of Bozeman held a latex paint exchange in the summer of 1992. A HHW Collection program is planned for the summer of 1993.

Montana Industrial Waste Exchange

Montana Chamber of Commerce, P.O. Box 1730, Helena, 59624

The Montana Chamber of Commerce provide a clearinghouse and listing of industrial waste materials for exchange, with fundinfg from MDHES.

Pollution Prevention Education Program

Karen Bucklin Sanchez and Michael Vogel, MSU Extension Service, Taylor Hall, Bozeman, 59717, 994-3451

This is an education program designed to prevent hazardous material pollution of air, soil, and water from small businesses and agricultural operations. The emphasis of the three-year effort is to prevent soil, air and water pollution through waste reduction practices, water and energy conservation, integrated solid waste management strategies, and introduction of innovative operation and equipment practices. Through a pollution prevention resource and loan library, the media, on-site visits and training workshops, Montana businesses will be able to receive technical support from MSU and other cooperating state agencies: the Department of Agriculture, the United States Environmental Protection Agency,

the Department of Health and Environmental Sciences, and the Department of Natural Resources and Conservation.

Used Oil Collection Points

Anaconda	Intermountain Bus Depot, 7 Main Street, 563-5246
Billings	A&B Used Oil Service, 440 Hillview Lane, 245-5745 Browning Ferris Industries, P.O. Box 30596, 248-5400
Bozeman	City of Bozeman Shops, 814 North Bozeman, 586-3321 Hoadley's, 5 East Mendenhall, 586-2569
Culberston	Culbertson Landfill
Ennis	Lick-A-Dee-Lube, Hwy 287, 682-5823
Glendive	Area Pump & Re-Cyc, HC 68 Box 6830, 365-3115
Great Falls	The Parts Store, 217 Vaughn Road, 453-6509 Oily Waste Processors, 172 North Manchester Road, 761-3512
Hamilton	Quick Lube, 1000 North 1st, 363-4221
Hardin	Hardin Landfill
Havre	Hayward's Muffler Shop, 401 1st Street West, 265-5528 Heltne Oil Co., 140 1st Street, 265-4346
Helena	City of Helena Landfill, 447-8459 Quick Lube, 1415 North Montana Avenue, 443-7321
Kalispell	Flathead Industries, 305 3rd Avenue NW, 755-3280 Korn Buick, 1212 South Main, 755-7777
Libby	Orr Disposal, 2049 Hwy 2 South, 293-3711
Livingston	Park County Refuse Disposal, 328 North M Street, 222-6232
Miles City	Browning Ferris Industries, 232-0109
Missoula	Browning Ferris Industries, Missoula Landfill, 543-3157 Ozzie's Oil & Drain, 900 Phillips, 543-7911 Sears Auto Department, Southgate Mall, 721-4410

Pablo	B.C. Auto Center, Hwy 93, 675-2299
Polson	Pioneer Chevrolet, Hwy 93 South, 883-5231
Ravalli	Good's Muffler Service, Hwy 93, 745-3491
Ronan	Don Aadsen Ford, 607 Hwy 93 North, 676-4420
St. Ignatius	Stuart's Service Center, 240 Mountain View, 745-2190
Superior	Felstet Disposal, 100 West Mullan Road, 822-4784
Thompson Falls	Moore Oil, 215 Main, 827-3498

#### Used Tire Collection Points

Columbus	MTS Recyclers, PO Box 1176, 800-291-TYRE, 322-5110
Polson	Tires-R-Us, 203 Courville Rd., 833-6110

**\*\*Information for this appendix was collected from materials provided by a number of sources including, Michael P. Vogel, Ed.D., Associate Professor and MSU Extension Service Solid Waste Education Specialist; the Montana Environmental Information Center; and Keep Montana Clean and Beautiful.**





## APPENDIX E

### REGIONAL AND NATIONAL INTEGRATED WASTE MANAGEMENT RESOURCES

#### Regional Recycling Organizations

**Mid-Continent Recycling Association (MCRA)/** 1200 Missouri Avenue/ P.O. Box 5520/  
Bismarck, ND 58502-5520/ Phone: (701) 221-5150/ Fax: (701) 221-5200

Includes: Manitoba, Minnesota, Montana, Nebraska, North Dakota,  
Saskatchewan, South Dakota, and Wyoming

**Midwest Assistance Program (MAP)/** P.O. Box 81/ New Prague, MN 56071/ Phone:  
(800) 822-2981/ Fax: (612) 758-4336

Montana Field Offices:

Bill Leonard/ P.O. Box 1456/ Whitefish, MT 59937/ Phone: (406) 862-3600  
Judy Sass/ P.O. Box 516/ Florence, MT 59833/ Phone: (406) 273-0410

Includes: Iowa, Minnesota, Missouri, Montana, Nebraska, North Dakota, South  
Dakota, and Wyoming

**Pacific NorthWest Economic Region/** c/o Northwest Policy Center/ University of  
Washington/ 327 Parrington Hall, DC-14/ Seattle, WA 98195/ Phone: (206) 543-7900/  
Fax: (206) 543-1096

Includes: Alaska, Alberta, British Columbia, Idaho, Montana, Oregon, and  
Washington

**Western States Contracting Alliance (WSCA)/** Kay Hawley/ Department of General  
Administration/ Office of State Procurement/ 216 General Administration Building,  
AX-22/ Olympia, WA 98504-0622/ Phone: (206) 753-0900

Includes: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Minnesota,  
Montana, Nebraska, Nevada, New Mexico, Utah, South Dakota, Washington,  
Wisconsin, Wyoming, American Samoa, and Guam

**Western States Recycling Coalition (WSRC)/** Council of State Governments/ 121 2nd  
Street, 4th Floor/ San Francisco, CA 94105/ Phone: (415) 974-6422/ Fax:  
(415) 974-1747

Includes: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana,  
Nevada, New Mexico, Utah, Washington, Wyoming, American Samoa, Northern  
Mariana Islands, and Guam

## Regional and National Solid Waste Contacts

**Center for Policy Alternative/** 2000 Florida Avenue, NW/ Washington, D.C. 20009/  
(202) 387-6030

**Community Environmental Council/** 930 Miramonte Drive/ Santa Barbara, CA 93109/  
(805) 963-0583

**Environmental Defense Fund/** 1616 P Street, NW/ Washington, D.C. 20036

**Inform, Inc./** 381 Park Avenue South/ Suite 1201/ New York, NY 10016/  
(212) 689-4040

**Institute for Local Self-Reliance/** 2425 18th Street NW/ Washington, D.C. 20009/  
(202) 232-4108

**Local Government Commission/** 909 12th Street, Suite 205/ Sacramento, CA 95814/  
(916) 448-1198

**National Technical Information Services (NTIS)/** (703) 487-4650

**National Recycling Coalition, Inc./** 1101 30th Street NW, Suite 305/ Washington, D.C.  
20007/ (202) 625-6406

**National Resource Recovery Association/** U.S. Conference of Mayors/ 1620 Eye Street,  
NW/ Washington, D.C. 20006/ (202) 293-7330

**Pacific Materials Exchange/** 1522 North Washington Street, Suite 202/ Spokane, WA  
99201-2454/ (509) 325-0551

**RCRA Information Center/** U.S. Environmental Protection Agency/ Office of Solid  
Waste (OS-305)/ 401 M Street SW/ Washington, D.C. 20460/ **RCRA Hotline:**  
(800) 424-9346/ (for the hearing impaired) TDD (800) 553-7672

**SWAP (Solid Waste Assistance Program)/** P.O. Box 7219/ Silver Spring, MD 20907/  
Technical Assistance Line: 1-800-677-9424

**U.S. EPA--Region 8/** Denver Place (811WM-RI)/ 999 18th Street, Denver, CO  
80202-2405/ Denver, CO 80202-2405

Periodicals

BioCycle: Journal of Waste Recycling/ 419 State Avenue/ Emmaus, PA 18049/  
(215) 967-4135

MSW Management: The Journal for Municipal Solid Waste Professionals/ Forester  
Communications, Inc./ 216 East Gutierrez/ Santa Barbara, CA 93101/ (805) 899-3350

Recycling Times: Newspaper of Recycling Markets/ 1730 Rhode Island Avenue NW,  
Suite 1000/ Washington, D.C. 20036/ (800) 424-2869

Recycling Today/ 4012 Bridge Avenue/ Cleveland, OH 44113-3320

Resource Recovery Report/ 5313 18th Street, NW/ Washington, D.C. 20015

Resource Recycling: North America's Recycling Journal/ P.O. Box 10540/ Portland, OR  
97210/ (800) 227-1424

Waste Age/ 1730 Rhode Island Avenue NW, Suite 1000/ Washington, D.C. 20036/  
(800) 424-2869

World Waste/ Fulfillment Dept./ P.O. Box 41369/ Nashville, TN 37204-1094  
(615) 377-3322





## APPENDIX F

### WASTE GENERATION AND COMPOSITION IN MONTANA

#### Waste Generation Rates

In 1976, the Montana Department of Health and Environmental Sciences (MDHES) published a State Solid Waste Management Strategy, which analyzed waste audits conducted at 10 representative landfills of varying size and locations in 1975. The following data were reported:

Population	Waste Generation Rate (pounds/person/day)
Greater than 5,000	5.70
1,000 - 5,000	3.25
Less than 1,000	2.25

(See, Henningson, Durhan & Richardson, *State Solid Waste Management Strategy*, prepared for the State of Montana, Department of Health and Environmental Sciences, December 1976.)

Using disposal data reported in 1992, MDHES now estimates that Montanans generate 4.8 pounds/person/day. In the Characterization of Municipal Solid Waste in the United States: 1992 Update, the EPA estimates that in 1990, the average U.S. resident discarded 4.3 pounds/person/day.

There are several reasons to question the accuracy of this waste generation data.

1. Since few Montana landfills have scales, many operators used an assumed per capita waste generation rate to calculate the volume of waste received, rather than a volume or weight estimate. The waste generation rates used were based on the 1975 waste audits.
2. Consumption patterns have changed in many ways in the past two decades and the rates presented in the '75 study are not likely valid today. In addition, the study suggested that rural populations generate less than half the waste generated by urban populations. There is no logical reason to believe that rural people generate less waste; they may simply take less waste to the landfill. Rural people may dispose of their own waste on their own land.
3. Multiplying the 1975 waste generation rates with the actual population figures reported in the 1990 census, yields a total waste generation of 548,000 tons per year, a waste generation rate of 3.8 lbs/person/day. This is only 74% of what was

actually reported in 1991, pointing to the inadequacy of using 1975 waste generation rates.

4. EPA's estimate is based on nation-wide experience and may not be representative of Montana. Using their estimate of 4.3 lbs/person/day, Montanans would have generated 627,753 total tons. This is only 84% of the actual amount reported in 1991.
5. For waste disposal facilities without scales, operators often made very rough volume estimates, which may not have been accurate. In addition, since a per ton fee was assessed, they had an incentive to estimate low.
6. There are no reporting mechanisms in place for most industrial wastes, farm dumps, or illegal disposal sites. If all these were reported, waste tonnage figures and generation rates would be much higher.

#### Waste Composition

In the 1975 study, samples of residential and commercial waste being brought to landfills by packer trucks were examined for content in the four largest Montana cities. The table below summarizes the results and compares them to national averages published by the EPA at the time.

Waste Composition Comparison (Percent by Wet Weight)

WASTE TYPE	MONTANA - 1975	EPA - 1975
Paper	38.2	37.8
Plastic	5.8	3.8
Yard	11.7	14.6
Food	19.3	14.2
Glass	8.7	10.0
Metals	10.6	10.1
Other	5.7	9.5

The following pages contain waste composition information for each county in Montana. The information is derived by the Institute for Business and Industry Development of North Dakota State University<sup>1</sup> from the nationwide estimates provided by the EPA in the Characterization of Municipal Solid Waste in the United States: 1992 Update. Care should be exercised in the use of this data, for reasons described in number 4 above.

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<sup>1</sup> Feasibility Study for the Mid-Continent Recycling Association, prepared for The Department of Health and Consolidate Laboratories in conjunction with the Mid-Continent Recycling Task Force, February 24, 1993.

**Montana**

Total Population: 799,065  
1990

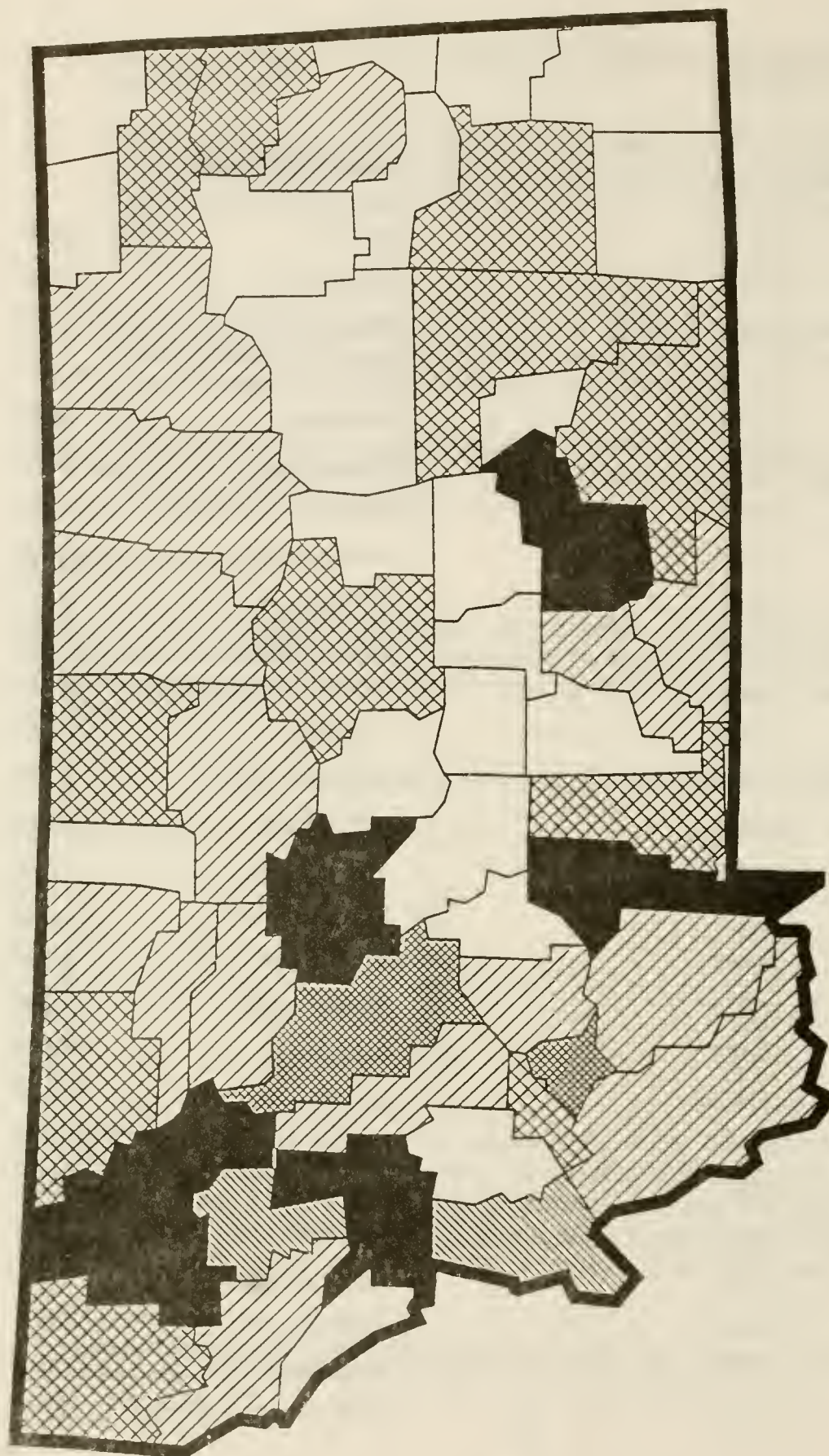
County Population

Yellowstone	113,419
Missoula	78,687
Cascade	77,691
Flathead	59,218
Gallatin	50,463
Lewis and Clark	47,495
Silver Bow	33,941
Ravalli	25,010
Lake	21,041
Hill	17,654
Lincoln	17,481
Park	14,562
Glacier	12,121
Fergus	12,083
Custer	11,697
Big Horn	11,337
Roosevelt	10,999
Richland	10,716
Rosebud	10,505
Deer Lodge	10,278
Dawson	9,505
Sanders	8,669
Beaverhead	8,424
Valley	8,239
Carbon	8,080
Jefferson	7,939
Blaine	6,728

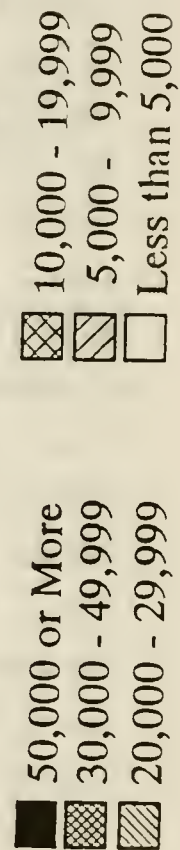
County Population

Powell	6,620
Stillwater	6,536
Pondera	6,433
Teton	6,271
Madison	5,989
Chouteau	5,452
Phillips	5,163
Broadwater	3,318
Mineral	3,315
Sweet Grass	3,154
Fallon	3,103
Granite	2,548
Liberty	2,295
Judith Basin	2,282
McCone	2,276
Daniels	2,266
Wheatland	2,246
Powder River	2,090
Meagher	1,819
Garfield	1,589
Carter	1,503
Prairie	1,383
Wibaux	1,191
Golden Valley	912
Treasure	874
Petroleum	519
Yellowstone Natl Park	52





## 1990 County Population: Montana





## COMPOSITION AND VOLUME (TONS) OF MUNICIPAL SOLID WASTE - MONTANA

Area Name	State Or Province	1 1990 Population	2 4lb/person/day Total Tons Waste per Year	3 37.5% Waste Composition		4 6.6% Waste Composition		5 12.2% Waste Composition		6 17.9% Waste Composition		7 8.3% Waste Composition		8 6.3% Metals (ferrous)		9 1.4% Metals (aluminum)		10 0.6% Metals Other	
				PAPER	WASTE	(newspaper)	(corr. boxes)	YARD WASTE	METALS	METALS	METALS	METALS	METALS	METALS	METALS	METALS	METALS	METALS	METALS
Beaverhead County MT	Montana	8,424	6,150	2,306	406	750	1,101	510	387	86	37								
Big Horn County MT	Montana	11,337	8,276	3,104	546	1,010	1,481	687	521	116	50								
Blaine County MT	Montana	6,728	4,911	1,842	324	599	879	408	308	69	29								
Broadwater County MT	Montana	3,318	2,422	908	160	298	434	201	153	34	15								
Carbon County MT	Montana	8,080	5,898	2,212	389	720	1,056	490	372	83	35								
Caribou County MT	Montana	1,503	1,097	411	72	134	198	91	69	15	7								
Cascade County MT	Montana	77,691	56,714	21,268	3,743	6,919	10,152	4,707	3,573	794	340								
Chouteau County MT	Montana	5,452	3,980	1,492	263	486	712	330	251	58	24								
Custer County MT	Montana	11,697	8,539	3,202	564	1,042	1,528	709	538	120	51								
Danville County MT	Montana	2,266	1,654	620	108	202	296	137	104	23	10								
Dawson County MT	Montana	9,505	6,939	2,602	458	847	1,242	576	437	97	42								
Deer Lodge County MT	Montana	10,278	7,503	2,814	495	915	1,343	623	473	105	45								
Fallon County MT	Montana	3,103	2,265	849	150	278	405	188	143	32	14								
Fergus County MT	Montana	12,083	8,821	3,308	582	1,076	1,579	732	556	123	53								
Flathead County MT	Montana	59,218	43,229	16,211	2,853	5,274	7,738	3,588	2,723	605	259								
Gallatin County MT	Montana	50,463	36,838	13,814	2,431	4,494	6,594	3,058	2,321	518	221								
Garfield County MT	Montana	1,589	1,160	435	77	142	208	96	73	16	7								
Glacier County MT	Montana	12,121	8,848	3,318	584	1,079	1,584	734	557	124	53								
Golden Valley County MT	Montana	912	668	250	44	81	119	55	42	9	4								
Granite County MT	Montana	2,548	1,860	698	123	227	333	154	117	26	11								
Hill County MT	Montana	17,654	12,887	4,833	851	1,572	2,307	1,070	812	180	77								
Jefferson County MT	Montana	7,839	5,795	2,173	383	707	1,037	481	395	81	35								
Judith Basin County MT	Montana	2,282	1,668	625	110	203	298	138	105	23	10								
Lake County MT	Montana	21,041	15,360	5,760	1,014	1,874	2,749	1,275	968	215	92								
Lewis and Clark County MT	Montana	47,495	34,671	13,002	2,288	4,230	6,206	2,878	2,184	485	208								
Liberty County MT	Montana	2,295	1,675	628	111	204	300	139	106	23	10								
Lincoln County MT	Montana	17,481	12,761	4,785	842	1,557	2,284	1,059	804	179	77								
McCone County MT	Montana	2,276	1,691	623	110	203	297	138	105	23	10								
Madison County MT	Montana	5,989	4,372	1,639	289	533	783	363	275	61	20								
Meagher County MT	Montana	1,819	1,328	498	88	162	238	110	84	19	8								
Mineral County MT	Montana	3,315	2,420	907	160	295	433	201	152	34	15								
Missoula County MT	Montana	78,637	57,442	21,541	3,781	7,008	10,282	4,768	3,619	804	345								
Musselshell County MT	Montana	4,106	2,997	1,124	198	366	537	249	189	42	18								
Park County MT	Montana	14,432	10,630	3,986	702	1,297	1,903	882	670	149	64								
Petroleum County MT	Montana	519	379	142	25	46	68	31	24	5	2								

Column 1: 1990 U.S. Census &amp; 1991 Canadian Census. Column 2-29: Estimates cited from EPA "Characteristics of Municipal Solid Waste in the United States: 1992 Update."

## COMPOSITION AND VOLUME (TONS) OF MUNICIPAL SOLID WASTE - MONTANA

Area Name	State Or Province	1 1990 Population	2 4lbs/person/day Total Tons Waste per Year	3 37.5% Waste Composition		4 8.6% Waste Composition		5 12.2% Waste Composition		6 17.9% Waste Composition		7 8.3% Waste Composition		8 6.3% Metals (ferrous)		9 1.4% Metals (aluminum)		10 0.6% Metals Other	
				PAPER		(newspaper)		(corr. boxes)		YARD WASTE		METALS							
Phillips County MT	Montana	5,163	3,769	1,413		249		460		675		313		237		53		23	
Pondera County MT	Montana	6,433	4,696	1,761		310		573		841		390		296		66		28	
Powder River County MT	Montana	2,090	1,528	572		101		186		273		127		96		21		9	
Powell County MT	Montana	6,820	4,833	1,812		319		590		865		401		304		68		28	
Prairie County MT	Montana	1,383	1,010	379		67		123		181		84		64		14		6	
Ravalli County MT	Montana	25,010	18,257	6,846		1,205		2,227		3,268		1,515		1,150		256		110	
Richland County MT	Montana	10,716	7,823	2,934		516		954		1,400		648		493		110		47	
Roosevelt County MT	Montana	10,999	8,029	3,011		530		980		1,437		666		508		112		48	
Rosebud County MT	Montana	10,505	7,669	2,878		506		936		1,373		636		483		107		46	
Sanders County MT	Montana	6,668	6,328	2,373		418		772		1,133		525		398		88		38	
Sheridan County MT	Montana	4,732	3,454	1,295		228		421		618		287		218		46		21	
Silver Bow County MT	Montana	33,941	24,777	9,291		1,835		3,023		4,435		2,056		1,561		347		149	
Stillwater County MT	Montana	6,536	4,771	1,789		315		582		854		398		301		67		29	
Sweet Grass County MT	Montana	3,154	2,302	863		152		281		412		181		145		32		14	
Teton County MT	Montana	6,271	4,578	1,717		302		558		819		380		288		64		27	
Toole County MT	Montana	5,046	3,684	1,381		243		448		659		306		232		52		22	
Treasure County MT	Montana	874	638	239		42		78		114		53		40		9		4	
Valley County MT	Montana	8,239	6,014	2,255		397		734		1,077		499		379		84		36	
Wheatland County MT	Montana	2,246	1,640	615		108		200		283		136		103		23		10	
Wilboux County MT	Montana	1,191	869	326		57		106		156		72		55		12		5	
Yellowstone County MT	Montana	113,419	82,786	31,048		5,465		10,101		14,820		6,872		5,216		1,159		497	
Yellowstone National Park	Montana	52	38	14		3		5		7		3		2		1		0	

Column 1: 1990 U.S. Census &amp; 1991 Canadian Census, Column 2-9: Estimates cited from EPA "Characteristics of Municipal Solid Waste in the United States: 1992 Update"

## COMPOSITION AND VOLUME (TONS) OF MUNICIPAL SOLID WASTE - MONTANA

Area Name	11 0.1% Steel Beer and Soft Drink Cans	12 1.3% Steel Food and Other Cans	13 0.1% Steel Other	14 0.8% Aluminum Beer and Soft Drink Cans	15 0.2% Aluminum Foil and Closures	16 6.7% Waste Composition GLASS	17 2.9% Waste Composition (beer & soft drink)	18 1.1% Waste Composition (wine & liquor)	19 2.1% Waste Composition (food & other fare)	20 8.3% Waste Composition PLASTICS
Beauregard County MT	6	80	6	48	12	412	178	68	129	510
Big Horn County MT	8	108	8	66	17	554	240	91	174	687
Blaine County MT	5	64	5	39	10	329	142	54	103	408
Broadwater County MT	2	31	2	19	5	162	70	27	51	201
Carbon County MT	6	77	6	47	12	395	171	65	124	490
Carter County MT	1	14	1	9	2	74	32	12	23	91
Cascade County MT	57	737	57	454	113	3,800	1,645	824	1,191	4,707
Chouteau County MT	4	52	4	32	8	267	115	44	84	330
Custer County MT	9	111	9	68	17	572	248	94	179	709
Daniels County MT	2	22	2	13	3	111	48	18	35	137
Dawson County MT	7	90	7	56	14	465	201	76	146	576
Deer Lodge County MT	8	99	8	60	15	503	218	83	158	623
Fallon County MT	2	29	2	18	5	152	66	25	48	188
Fergus County MT	9	115	9	71	18	591	258	97	185	732
Flathead County MT	43	562	43	346	86	2,896	1,254	476	908	3,588
Gallatin County MT	37	478	37	295	74	2,468	1,068	405	774	3,058
Garfield County MT	1	15	1	9	2	78	34	13	24	96
Glacier County MT	9	115	9	71	18	593	257	97	186	734
Golden Valley County MT	1	9	1	5	1	45	19	7	14	65
Granite County MT	2	24	2	15	4	125	54	20	39	154
Hill County MT	13	168	13	103	26	863	374	142	271	1,070
Jefferson County MT	6	75	6	46	12	388	168	64	122	481
Judith Basin County MT	2	22	2	13	3	112	48	18	35	138
Lake County MT	15	200	15	123	31	1,029	445	169	323	1,275
Lewis and Clark County MT	35	451	35	277	69	2,323	1,005	381	728	2,878
Liberty County MT	2	22	2	13	3	112	49	18	35	139
Lincoln County MT	13	168	13	102	28	855	370	140	268	1,059
McCone County MT	2	22	2	13	3	111	48	18	35	138
Madison County MT	4	57	4	35	9	293	127	48	92	363
Meagher County MT	1	17	1	11	3	89	39	15	28	110
Mineral County MT	2	31	2	19	5	162	70	27	51	201
Missoula County MT	57	747	57	460	115	3,849	1,668	632	1,208	4,768
Musselshell County MT	3	39	3	24	6	201	87	33	63	249
Park County MT	11	138	11	85	21	712	308	117	223	882
Petroleum County MT	0	5	0	3	1	25	11	4	8	31

Column 1: 1990 U.S. Census &amp; 1991 Canadian Census, Column 2-29: Estimates cited from EPA "Characteristics of Municipal Solid Waste in the United States: 1992 Update"

## COMPOSITION AND VOLUME (TONS) OF MUNICIPAL SOLID WASTE - MONTANA

Area Name	11 0.1% Steel		12 1.3% Steel	13 0.1% Steel	14 0.8% Aluminum		15 0.2% Aluminum		16 6.7% Waste		17 2.9% Waste		18 1.1% Waste		19 2.1% Waste		20 8.3% Waste		
	Beer and Soft Drink Cans	Other Cans	Food and Steel	Other	Beer and Soft Drink Cans	Foil and Closures	GLASS	Composition (beer & soft drink)	Composition (wine & liquor)	Composition (food & other jars)	Composition PLASTICS								
Phillips County MT	4	49		4	30	8	253	109	41	79	313								
Pondera County MT	5	61		5	38	9	315	136	52	89	390								
Powder River County MT	2	20		2	12	3	102	44	17	32	127								
Powell County MT	5	63		5	39	10	324	140	53	101	401								
Prefire County MT	1	13		1	8	2	68	29	11	21	84								
Ravalli County MT	18	237		18	146	37	1,223	529	201	383	1,515								
Richland County MT	8	102		8	63	16	524	227	88	164	649								
Roosevelt County MT	8	104		8	64	16	538	233	88	169	666								
Rosebud County MT	8	100		8	61	15	514	222	84	161	636								
Sanders County MT	6	82		6	51	13	424	184	70	133	525								
Sheridan County MT	3	45		3	28	7	231	100	38	73	287								
Silver Bow County MT	25	322		25	188	50	1,660	719	273	520	2,056								
Stillwater County MT	5	62		5	38	10	320	138	52	100	396								
Sweet Grass County MT	2	30		2	18	5	154	67	25	48	191								
Teton County MT	5	60		5	37	9	307	133	50	96	380								
Toole County MT	4	48		4	29	7	247	107	41	77	306								
Treasure County MT	1	8		1	5	1	43	19	7	13	63								
Valley County MT	6	78		6	48	12	403	174	66	126	499								
Wheatland County MT	2	21		2	13	3	110	48	18	34	136								
Wibaux County MT	1	11		1	7	2	58	25	10	18	72								
Yellowstone County MT	83	1,076		83	662	166	5,547	2,401	911	1,739	6,872								
Yellowstone National Park	0	0		0	0	0	3	1	0	1	3								

Column 1: 1990 U.S. Census &amp; 1991 Canadian Census. Column 2-29: Estimates cited from EPA "Characteristics of Municipal Solid Waste in the United States: 1992 Update"



## COMPOSITION AND VOLUME (TONS) OF MUNICIPAL SOLID WASTE - MONTANA

Area Name	21 0.2% Waste Composition (soft drink bottle)	22 0.2% Waste Composition (milk bottle)	23 0.9% Waste Composition (other cont.)	24 0.5% Waste Composition (bags & sacks)	25 0.8% Waste Composition (wraps)	26 6.7% Waste Composition FOOD WASTE	27 2.4% Waste Composition RUBBER & LEATHER	28 2.9% Waste Composition TEXTILES	29 6.3% Waste Composition WOOD
Beaverhead County MT	12	12	12	31	49	412	148	178	387
Big Horn County MT	17	17	17	41	66	554	199	240	521
Blaine County MT	10	10	10	25	39	329	118	142	308
Broadwater County MT	5	5	5	12	19	182	58	70	153
Carbon County MT	12	12	12	28	47	395	142	171	372
Carter County MT	2	2	2	5	8	74	26	32	69
Cascade County MT	113	113	510	284	454	3,800	1,361	1,645	3,573
Chouteau County MT	8	8	36	20	32	267	96	115	251
Custer County MT	17	17	77	43	68	572	205	248	538
Daniels County MT	3	3	15	8	13	111	40	48	104
Dawson County MT	14	14	62	35	58	465	167	201	437
Deer Lodge County MT	15	15	68	38	60	503	180	218	473
Fallon County MT	5	5	20	11	18	152	54	66	143
Fergus County MT	18	18	79	44	71	591	212	256	556
Flathead County MT	86	86	389	218	346	2,896	1,037	1,254	2,723
Gallatin County MT	74	74	332	184	295	2,468	884	1,068	2,321
Garfield County MT	2	2	10	6	9	78	28	34	73
Glacier County MT	18	18	80	44	71	593	212	257	557
Golden Valley County MT	1	1	6	3	5	45	16	19	42
Granite County MT	4	4	17	9	15	125	45	54	117
Hill County MT	26	26	116	64	103	863	309	374	812
Jefferson County MT	12	12	52	28	46	388	139	168	385
Judith Basin County MT	3	3	15	8	13	112	40	48	105
Lake County MT	31	31	138	77	123	1,028	369	445	968
Lewis and Clark County MT	69	69	312	173	277	2,323	832	1,005	2,184
Liberty County MT	3	3	15	8	13	112	40	48	106
Lincoln County MT	26	26	115	64	102	855	306	370	804
McCone County MT	3	3	15	8	13	111	40	48	105
Madison County MT	9	9	39	22	35	293	105	127	275
Meagher County MT	3	3	12	7	11	89	32	39	84
Mineral County MT	5	5	22	12	19	162	58	70	152
Missoula County MT	115	115	517	287	460	3,849	1,378	1,666	3,619
Musselshell County MT	6	6	27	15	24	201	72	87	189
Park County MT	21	21	96	53	85	712	255	308	670
Patroleum County MT	1	1	3	2	3	25	8	11	24

Column 1: 1990 U.S. Census &amp; 1991 Canadian Census, Column 2-29: Estimates cited from EPA "Characteristics of Municipal Solid Waste in the United States: 1992 Update"

COMPOSITION AND VOLUME (TONS) OF MUNICIPAL SOLID WASTE - MONTANA

Area Name	21 0.2% Waste Composition (soft drink bottles)	22 0.2% Waste Composition (milk bottles)	23 0.9% Waste Composition (other cont.)	24 0.5% Waste Composition (bags & sacks)	25 0.8% Waste Composition (wraps)	26 6.7% Waste Composition	27 2.4% Waste Composition	28 2.8% Waste Composition	29 6.3% Waste Composition
Phillips County MT	8	8	34	19	30	253	90	108	237
Pondera County MT	9	9	42	23	38	315	113	136	298
Powder River County MT	3	3	14	8	12	102	37	44	98
Powell County MT	10	10	43	24	39	324	116	140	304
Prairie County MT	2	2	9	5	8	68	24	29	64
Ravalli County MT	37	37	184	91	149	1,223	438	529	1,150
Richland County MT	16	16	70	39	63	524	188	227	493
Roosevelt County MT	16	16	72	40	64	538	193	233	508
Rosebud County MT	15	15	69	38	61	514	184	222	483
Sanders County MT	13	13	57	32	51	424	152	184	399
Sheridan County MT	7	7	31	17	28	231	83	100	218
Silver Bow County MT	50	50	223	124	188	1,660	595	718	1,561
Stillwater County MT	10	10	43	24	38	320	115	138	301
Sweet Grass County MT	5	5	21	12	18	154	55	67	145
Teton County MT	9	9	41	23	37	307	110	133	288
Toole County MT	7	7	33	18	29	247	88	107	232
Treasure County MT	1	1	6	3	5	43	15	19	40
Valley County MT	12	12	54	30	48	403	144	174	379
Wheatland County MT	3	3	15	8	13	110	39	48	103
Wibaux County MT	2	2	8	4	7	58	21	25	55
Yellowstone County MT	166	166	745	414	662	5,547	1,987	2,401	6,216
Yellowstone National Park	0	0	0	0	0	3	1	1	2

Column 1: 1990 U.S. Census & 1991 Canadian Census. Column 2-29: Estimates cited from EPA "Characteristics of Municipal Solid Waste in the United States: 1992 Update"

## **APPENDIX G**

### **SUMMARY OF NEW INTEGRATED WASTE MANAGEMENT LEGISLATION**

#### **1991 LEGISLATIVE SUMMARY**

##### **Integrated Waste Management - HB-160**

- Provides for a solid waste reduction target - 25% by 1996
- Establishes integrated waste management priorities:
- Establishes a state government source reduction and recycling program
- Requires state government procurement of recycled supplies and materials
- Requires MDHES to prepare and implement a State Solid Waste Plan
- Requires the MDHES to serve as a clearinghouse for information on waste reduction and reuse, recycling technology and markets, composting, household hazardous waste, chemical compatibility

##### **Fees for Solid Waste Management System Licenses - SB-209**

- Sets license application fees, annual renewal fees, and tonnage disposal fees

##### **Revise Solid Waste Exemption - HB-660**

- Significantly broadens the solid waste handling activities regulated by the state
- Limits waste disposal exemptions to personal households, agricultural related activities, oil and gas activities, electrical generating facilities, mines, mills, smelters, and electrolytic reduction facilities

##### **Megalandfill Siting Act - HB-377**

- Provides a detailed siting process for landfills that accept over 200,000 tons of solid waste per year or an ash monofill that accepts over 35,000 tons of incinerator is classified a megalandfill

##### **Financial Assurance Megalandfill - HB-891**

- Sets a bonding requirement for reclamation work which covers closure, post closure, corrective action
- Allows the use bond money to reclaim affected natural resources
- Establishes a Megalandfill Reclamation Account

##### **Moratorium Extension - HB-139**

- Provides for a two-year extension of the ban on out-of-state solid waste importation for the purposes of disposal or incineration until October 1, 1993

##### **Infectious Waste Management Act - HB-239**

- Gives established state Professional and Occupational Boards authority to regulate infectious waste management practices by these professions

- MDHES retains authority to regulate all other infectious waste generators and disposal systems including importation

**Multi-County Districts - SB-189**

- Eases the formation of Multi-County Solid Waste Management Districts
- Extends contract terms to 10 years

**Differential Importation Fee - SB-346**

- Sets a \$5 per ton fee for solid wastes brought into Montana for disposal or incineration after July 1, 1993

**Transportation of Recyclables - HB-263**

- Gives Class-D and Class-C haulers authority to collect and haul source-separated recyclables

**Household Hazardous Waste (HHW) Education Program - HB-858**

- Requires a state-wide HHW educational program aimed at source reduction and alternative product use

**Oil Recycling Sign - HB-145**

- Requires motor oil retailers to display an MDHES-designed sign directing the public to the nearest oil recycling center

**Absolute Liability for Solid Waste - SB-400**

- Establishes absolute liability for improper disposal of solid wastes for all owners or previous owners of solid waste

**Recycling Tax Credit for Business - SB-111**

- Provides a 25% tax credit for investment in property used to collect or process reclaimable materials or to manufacture a product from reclaimed material
- Provides a 5% tax deduction for businesses that purchase recycled products
- Terminates tax credit on December 31, 1995

**MDHES to Consult with Local Government in Solid Waste Licensing Decisions - SB-357**

- Requires MDHES to consult with local government having jurisdiction in the area when licensing a solid waste management system.

**Secured Loads for Vehicles Hauling Solid Waste - HB-732**

- Requires vehicles hauling solid waste on public roads to be covered, except for commercial haulers and unprocessed agricultural product haulers.

**Solid and Hazardous Waste Incinerator Permitting - HB-607**

- Requires an air quality permits for hazardous waste incinerators



- Removes air quality permitting requirements for solid waste incinerators that burn less than 200 pounds per hour

#### **Solid Waste Definition - HB-918**

- Create a common definition of solid waste throughout solid waste statutes.

### **1993 LEGISLATIVE SUMMARY**

#### **Justifiable fee on the disposal of out-of-state waste -- HB-64**

- Requires the MDHES to adopt a rule by August 1, 1993, to set a per ton fee for the incineration and disposal of imported wastes. The fee is to be based on the actual direct and indirect cost to the state for administering the solid waste laws and rules in relation to out-of-state wastes.
- Applies to all facilities that accept out-of-state waste from August 1, 1993, until July 1, 1995.
- After July 1, 1995, applies only to those disposal facilities that accept less than 25,000 tons of waste total on an annual basis. All incinerators and all other disposal facilities will be assessed the legislated \$5.00 per ton fee.

#### **Air quality permits for solid waste incinerators regardless of size -- HB 380**

- Removes the exemption for solid waste incinerators designed to burn less than 200 lbs/hour. All new solid waste incinerators, regardless of size must obtain an air quality permit.
- Requires air quality permits for new boilers or industrial furnaces burning hazardous wastes.
- Does not apply to existing incinerators

#### **Solid Waste Districts may collect money through tax notices and property liens --HB 414**

- Amends the tax collection authority of solid waste districts to allow the district to pay for bonds, loans, or other obligations with money collected through tax notices and from liens upon property.

#### **Definition of Megalandfill -- HB 454**

- Amends the definition of a Megalandfill to exclude any facility that received 100,000 tons of waste or more as of December 31, 1991, (Billings Landfill) until they reach 300,000 tons per year. All other facilities become a Megalandfill when they reach 200,000 tons annually.

#### **Definition of "postconsumer material" and increased tax deduction for purchase -- HB 519**

- Defines the meaning of postconsumer material as it relates to recycling and increased the tax credit for businesses that purchase and use recycled material from 5% to 10% of the purchase price.

**Exception from the waste importation moratorium for intermediate and minor landfills--  
HB 532**

- Exempts all solid waste management facilities that accept 25,000 tons or less of waste annually from the moratorium on the import and disposal of out-of-state waste from neighboring states.

**Medical Waste Facility Siting -- HB 567**

- Strengthens the application and emission requirements for hazardous waste and medical waste incinerators.
- Allows MDHES to conduct joint reviews between the Air Quality Bureau and Solid & Hazardous Waste Bureaus when licenses are required by both without the limiting time frames in the Air Quality Laws.
- Sets provisions for mandatory notices and public hearings on any submittal.

**Solid Waste Housekeeping -- SB 67**

- Corrects omissions and mistakes made in legislation from the previous legislative session.

**Remove container sites from licensing requirements -- SB 319**

- Deletes container sites from the definition of a solid waste management system, thereby removing them from the solid waste system licensing and regulatory requirements.
- Grants local governments the power to regulate the siting and operation of these sites.





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